

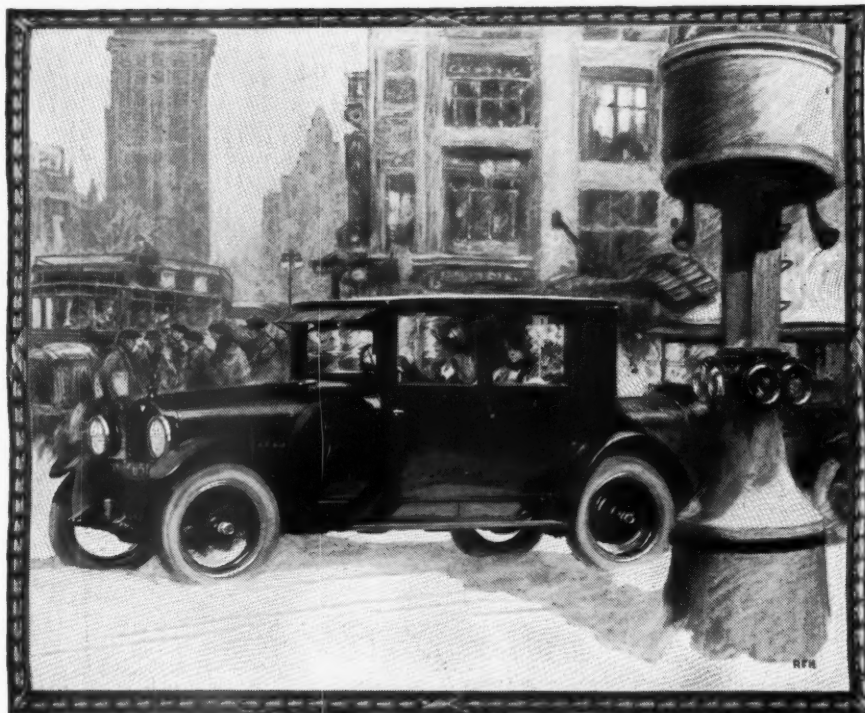
In This Issue—A Successful Small Town Dealer

MOTOR AGE

Vol. XLIV
Number 17

PUBLISHED WEEKLY AT THE MALLERS BUILDING
CHICAGO, OCTOBER 25, 1923

Thirty-five Cents a Copy
Three Dollars a Year



Biggest Sales in Our History

Follow Hudson's New Low Prices

Now the finest Hudson ever built is priced the lowest for which the Super-Six ever sold. It gives Hudson a new margin of advantage in price and quality. And remember for eight years Hudson has outsold all fine cars.

Hudson dealers are prosperous. Now their opportunity is greater than ever. Small line of cars to stock—only four models. Big demands and clean deals. Closed car comforts at open car cost. The Coaches are exclusive to Hudson and Essex. They mean active all year sales. Small free service costs. Assets of \$20,000,000—no debts. That means permanency. A finance plan of liberal terms.

Greatest Values Hudson Ever Offered

Speedster . .	\$1295
7-Pass. Phaeton	1350
Coach . . .	1375
Sedan . . .	1895

Freight and Tax Extra

Means Money to Dealers

Some Good Territories Are Open

Write Today

HUDSON MOTOR CAR COMPANY, DETROIT, MICHIGAN

PREVENTABLE TROUBLES—No. 7—STICKING VALVES
Does the Piston Ring You Use Cause or Prevent Them?



"Do you recognize it, Mr. Blake."
"Er—yes—I think it's my valve. But how the d—"
"Easy—the wrong piston rings. Oil climbed up into the cylinder head and formed carbon. Clogged valves heated up, then warped."

NO-LEAK-O

Piston Rings

Made in one piece, easy to install, quick seating, of finest material, guaranteed against breakage and individually tested for accuracy. Brinell tested for correct hardness. Give equal tension on the cylinder walls. The leading replacement ring. Over 200 reliable jobbers carry No-Leak-O in standard sizes and over sizes.



Important: in buying Piston Rings insist on the genuine No-Leak-O with the original "oilSEALing" groove, packed in this standard package bearing the famous ring and seal, our registered trademark. Beware of imitations.

The up-to-date repairman is known by the trouble he prevents. A trouble preventer builds up and holds a steady business because he sees possible trouble coming and saves his customers from the curse of "HIGH UP-KEEP." The "near mechanic" and the "gyp" may ask, "What's the commission in that kind of business?" Well, the commission comes in having your customers stick close to you for everything they buy or need and in bringing their friends along with them. The "gyp" can't see this. You repairmen can prevent this trouble by using No-Leak-Os. What do you say?

No-Leak-Os "won't leak because they're sealed with oil." A specially cut groove—the "oilSEALing" groove—found only in No-Leak-O Piston Rings—packs an oil film in between your piston and cylinder walls like "packing" in a pump. This oil "packing" seals in all the expanding gas. Every drop must work. By simply reversing the top ring, no unburnt gas or coal oil can seep down into the crank case to thin out lubrication. In this way No-Leak-O prevents 75% of all motor troubles. No-Leak-Os hold your customers because they make the right repair job, use less oil, less gas and give more Power.

Write for valuable booklet, "How to Fit Piston Rings."
Also let us tell you how our liberal dealer proposition can increase your profits.

One Price during eight years of continued success.
One design—for all cars—50c and up.

NO-LEAK-O PISTON RING COMPANY
Dept. 178 Muskegon, Michigan

WON'T LEAK

because they're sealed with Oil

MOON

in

Los Angeles



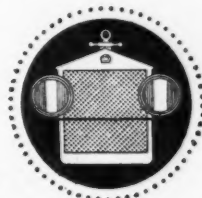
A Winner in the West!

During his very first month in business Don. P. Smith, the new Moon distributor in Los Angeles, California, sold 36 Moon Cars. And sales for his first three months were 373% above the amount of business done in the same territory during the same period of 1922. But read Mr. Smith's telegram:

"May, nineteen twenty-three, our first month in business, sold and delivered 36 Moon cars. Sales for June, July and August were 120 cars. Sold 53 in September. Made a substantial net profit the first month and each succeeding month. Watch us in nineteen twenty-four."

It's still another case of doubling sales—with the Moon!

Will you double your sales in 1924?



MOON MOTOR CAR COMPANY, ST. LOUIS, U. S. A.
Stewart McDonald, President



STOP!

That's What a Wayne Pump Says to Passing Motorists

You can cause a certain number of motor car drivers to stop at your salesroom, garage, accessory, tire or battery store, every day, and make a purchase.

A Wayne gasoline pump installed on the curb in front of your place of business, will do this for you.

A Wayne Pump is always on the job, always persistently but silently reminding the passing throng of car drivers that they should stop for gasoline.

You make a first profit on the gasoline or oil they buy, and you make a larger profit on sales to them, *if you intelligently use the pump to merchandise your lines.*

Have a Wayne Pump installed, *place a good salesman in charge of it*, and watch how business will increase.

Let us tell you the experience of others in your field. Write us today for the interesting facts.

Wayne Gasoline Pumps Are of Various Types and Sizes, and Are Sold at corresponding Prices. They are Made by a Company which for More Than 30 Years Has Been Noted for the Advanced Design and Goodness of Its Products, and which Today Is the Acknowledged Leader in Its Field

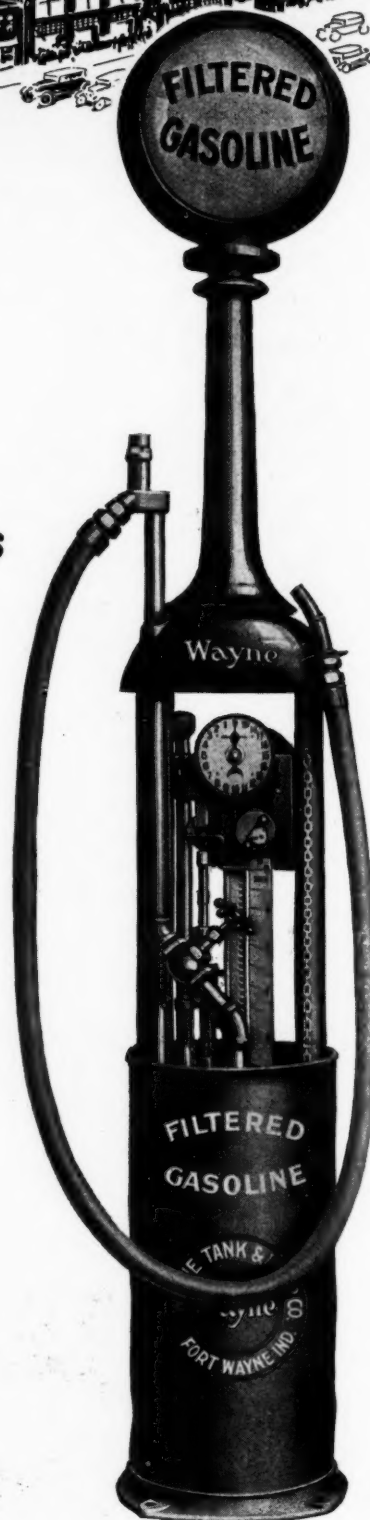
Wayne Tank & Pump Co., 706 Canal St., Fort Wayne, Ind.

Wayne Tank & Pump Co. of Canada, (Ltd.), Toronto, Ontario, Canada
Wayne Tank & Pump Co., 9 Kingsway, London, W. C. 2, England

Division Offices in: Atlanta, Birmingham, Boston, Chicago, Cincinnati, Cleveland, Columbus, Dallas, Dayton, Des Moines, Detroit, Indianapolis, Jacksonville, Kansas City, Milwaukee, Minneapolis, New York, Omaha, Peoria, Philadelphia, Pittsburgh, San Francisco, St. Louis and South Bend

Warehouses in: Philadelphia and San Francisco

An International Organization With Sales and Service Offices Everywhere



REG. U.S. TRADE MARK

Wayne

HONEST MEASURE PUMPS

MOTOR AGE

Reg. U. S. Pat. Off.
Published Every Thursday by

THE CLASS JOURNAL COMPANY

5 So. Wabash Ave.
Chicago, Ills., U. S. A.

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North Carolina Sums It
Up In Two Words—

**"SERVICE and
QUALITY"**

"We have been handling a full line of Goodrich Tires for the past three years to the perfect satisfaction of our customers and to our own gain. Today we are more sold on Goodrich quality than the first time we put in our stock and we are handling Goodrich products exclusively."

HUGHES SALES and
SERVICE COMPANY
Wilmington, N. C.

There is little we can add to this endorsement. Many dealers, successful dealers, all over the country, will tell you the same story.

Build for permanency with Goodrich. People want *known quality*.

The
B. F. GOODRICH RUBBER CO.
Akron, Ohio

Goodrich
TIRES *Best in the Long Run*

CHASE DREDNAUT Motor Topping

"DEFIES TIME AND THE ELEMENTS"

You already know Chase Drednaut as the highest grade Motor Topping.

Not occasionally but *always*.

When you use Chase Drednaut Motor Topping there's no guessing how the top will look and wear.

You know positively

- that its appearance will be a credit to your skill.
- that the service it gives will build bigger business for you.
- that it will pay you a reasonable profit because most motorists know that "Chase" means *quality*.

Put an end to dissatisfaction by building *every* top of Chase Drednaut Motor Topping.

L. C. CHASE & CO., BOSTON

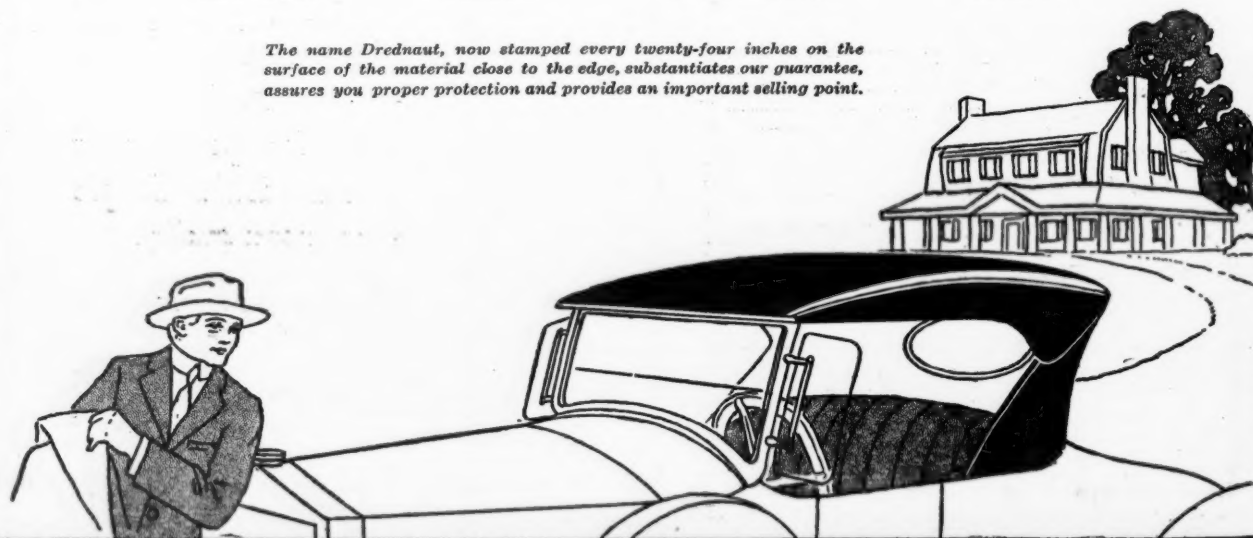
NEW YORK

DETROIT

SAN FRANCISCO

CHICAGO

The name Drednaut, now stamped every twenty-four inches on the surface of the material close to the edge, substantiates our guarantee, assures you proper protection and provides an important selling point.



The Line that Triples the Salesman's Chances

A certain competitive salesman admits that it requires 90 contacts for him to complete a single sale.

Out of those 90 contacts not more than 20 could possibly be considered as logical prospects for the car this salesman represents.

But he has to go on making the contacts just the same in the hope that he can fit as many of these families as possible—regardless of their needs and desires, with one of the cars in his limited line.

Same old story—trying to fit the foot to the shoe instead of the shoe to the foot.

Now, contrast this salesman's position with that of the Studebaker man. Practically every one of these 90 contacts falls into a class that is covered by one of the three models which Studebaker offers in thirteen body types.

Studebaker salesmen can accomplish more in the same time than other salesmen for the reason that no contact is wasted. Every man who is in the market for a car—except, of course, those in the very lowest priced field—is a Studebaker prospect.

To meet all the potential buyers many Studebaker dealers can use a few more capable retail men. The local Studebaker dealer will tell you more about this proposition and may have just the opportunity for which you have been wishing.

The handicap of an incomplete line has left many able salesmen in a rut. The Studebaker proposition offers a way out.

1924 MODELS AND PRICES—f. o. b. factory		
LIGHT-SIX 5-Pass., 112" W. B., 40 H. P.	SPECIAL-SIX 5-Pass., 119" W. B., 50 H. P.	BIG-SIX 7-Pass., 126" W. B., 60 H. P.
Touring.....\$995	Touring.....\$1350	Touring.....\$1750
Roadster (3-Pass.).....975	Roadster (2-Pass.).....1325	Speedster (5-Pass.).....1835
Coupe-Roadster (2-Pass.) 1225	Coupe (5-Pass.).....1975	Coupe (5-Pass.).....2550
Coupe (5-Pass.).....1475	Sedan.....2050	Sedan.....2750
Sedan.....1550		

THE STUDEBAKER CORPORATION OF AMERICA
South Bend, Indiana

STUDEBAKER



T H I S I S A S T U D E B A K E R Y E A R

\$935

f. o. b. factory



*Five Disc Wheels and Nash
Self-Mounting Carrier, \$25 additional*

A Profit-Building Model

The New Four Touring

Five Passengers

Nash ability to produce great motor car values has never been more emphatically evident than in the new Four Touring.

Dealers everywhere are reporting that this remarkable car is the greatest money-making model in the field of "fours."

So conspicuous and so compelling is its intrinsic worth that a prospective buyer need only contrast the car's advanced construction and extensive equipment with its low price to become thoroughly convinced that he is getting an unusually good return for his money.

Ten minutes behind the wheel almost invariably clinches the sale.

The ingenious new engineering improvements embodied in the Nash Four Touring are impressively apparent in a smoother, quieter, brisker performance.

Nash engineers have also achieved a new low standard of operating cost. The body lines, too, are extremely handsome and graceful. And the brakes have been endowed with greater power and efficiency.

Taken as a group, the new line of Nash fours and sixes presents a business opportunity seldom equaled for its profit-building possibilities.

A wire from you today will bring prompt information regarding some very desirable territory.

NASH

The Nash Motors Company, Kenosha, Wisconsin

(2202)

"The introduction of Balloon Tires on Cole car gives the Trade two of the greatest sales making points in the history of motoring"




When the scarcely inflated Balloon Tire meets an irregularity in the road, instead of bouncing up and down over it

—as do the ordinary harder tires—

Balloon Tires simply shift the air within the tube

—and accommodate their soft, yielding surface to the contour of the road.

Slight obstructions disappear within a cup-like depression in the pressure area.

The hub of the wheel does not rise or fall. It travels in an unaltered plane.

Even a "wash board" road has a velvety feel under this "accommodating" action of Balloon Tires.



When braking pressure is brought to bear on a Balloon Tire, the soft, air-cushion shifts its shape

—forming a yielding wedge on the surface of the road

—with its longest lines of contact presented against the very directions in which skids usually occur.

In addition this soft blanketing surface forms a vacuum with every road depression

—thus holding the car in its course

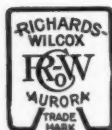
—and giving a non-skid resistance which adds immeasurably to the all-important factor of safety.

Balloon Tires stop a car quickly and effectively—with an added factor of increased safety.

And Balloon Tires have no
Service Complications

COLE

There's a Touch of Tomorrow in All Cole Does Today



Slidetite Garage Door Hardware

Gives Better Service on Any Type of Garage

The illustration shows "Slidetite" hung doors on the garage of "the most perfect house in America"—recently completed and already famous throughout architectural and building circles. But no matter what the type of the garage—from the smallest structure on the home lot to the big commercial station—"Slidetite" Garage Door Hardware is the most suitable for satisfactory and permanent hanging of the doors.

"Slidetite" equipped doors slide and fold inside, flat against the wall, leaving a wide, unobstructed opening. The doors open and close with the greatest ease in any weather, and cannot slam shut. Never sag and stick. Fit snug and weather-tight when closed. Only really practical method of hanging doors in extra wide openings up to 30 feet.

Before building a new garage or remodeling an old one, write for free "Slidetite" book, X-29. Contains many practical suggestions and illustrations of modern garage doorways. "Slidetite" may be obtained through hardware and lumber dealers everywhere.

New York
Boston
Philadelphia
Cleveland
Indianapolis
St. Louis

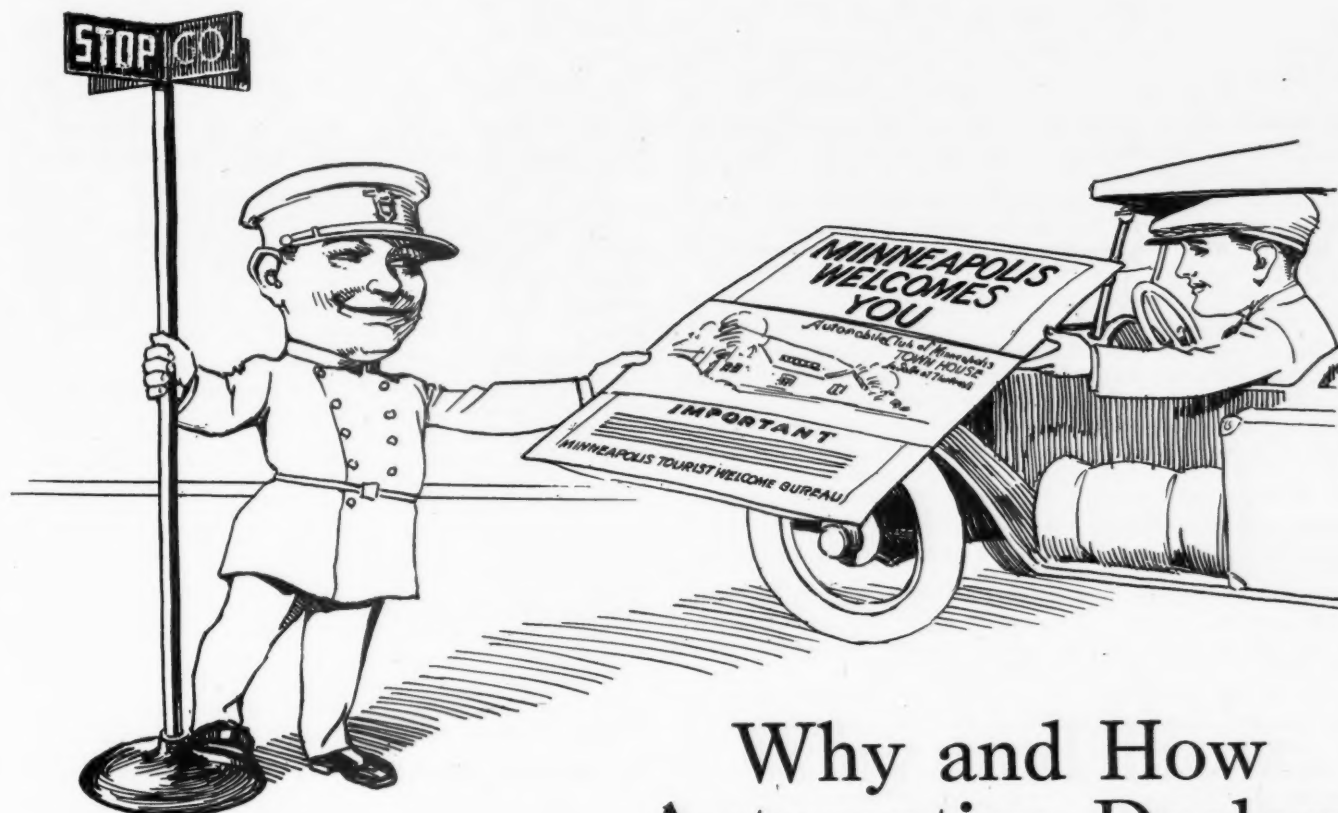
Richards-Wilcox Mfg. Co.

A Hanger for any Door that Slides.
AURORA, ILLINOIS, U.S.A.

RICHARDS-WILCOX CANADIAN CO. LTD.
Winnipeg LONDON, ONT. Montreal

Chicago
Minneapolis
Omaha
Kansas City
Los Angeles
San Francisco

MOTOR AGE



Why and How Automotive Dealers Can Boost Tourist Business

*Individual Travel on Recreational Trips Is
Now Biggest Lure for the Purchase of Cars*

By CLYDE JENNINGS



WHEN the driver of a "tourist" car arrives in Minneapolis the first traffic policeman he meets hands him an envelope in which is an official welcome to that municipality. On the face of this envelope is a statement that the state law requires persons expecting to retain cars in that state more than 10 days to register. This comes under an official welcome which is printed in large type.

The enclosure is a card directing you to the Town House of the Automobile Club of Minneapolis. On the reverse side of the card is a map showing you how to reach the Town House. Also there is a map of the city with parking and other restrictions indicated.

As a result of this effort, the automobile tourist feels that he is welcome in Minneapolis; that he is wanted there and that some one is interested in his knowing the restrictions that govern him so that he can become a law abiding driver while he stays in that community.

In a recent drive of more than 3,000 miles in the northeastern section of the country, the writer and his party were never made to feel that they were welcome in any place. Only gasoline station, hot dog stands and hotel proprietors were on the welcoming committee and often we wondered how these men had been drafted into this service. In fact, most of them entered the service because of a promise of a certain amount of graft, if one could judge from the way they extended the welcome.

How to Promote Touring

As a result of these observations, we began an inquiry into how the automotive industry could best promote its best sales help—the extensive use of the automobile in vacation and similar travel. In other words, the sale and use of the automobile as an individual transportation unit for other than necessary business.

The automobile is well sold for business and every salesman and kindred man who has not an automobile wants one and it is only a question of time until he buys one to increase his business efficiency.

In the tourist business, the situation is somewhat different. There is still some sales resistance. This is increasing as the newspapers feature accident reports and as arrests for minor violations of traffic laws pile up. One who does not drive, as well as the man who does, hears much about speed traps, traffic policemen, wrecks, poor hotel accommodations and other good time deterrents.

It is very true that most of these objectionable features are not of major importance, but they are gossip and there is no reason why they should be so much featured. The way to overcome this unpleasant gossip is to remove the cause.

Meeting Sales Resistance

The remedy, as we see it, for many of these troublesome, gossip, sales resistants, lies entirely within the power of the automotive dealers of any community to remove.

The automotive industry is now the first in importance in this country and so it has become of a major importance in any community. Test this out and you will be surprised in your own community, if you have not thought of it before. Gather reports showing the daily cash receipts of the automotive establishments in your community, the property investment, the realty holdings and rent paid and such other evidences of serious business interest as occur to you and then challenge any other business to match it.

This volume of business should bring a certain power with it. The voice of the industry should command attention in any section of the country, if there is gathered into one body the various ramifications, such as automotive dealers, accessory dealers, oil and gas dealers and the mechanical lines. You will find ready to join with you a number of eating and lodging houses.

You will also find among these men, members of the various business bodies of the community, such as the Chamber of Commerce, Rotary and kindred clubs and similar organizations that are looking forward to a better community.

Form a Community of Interest

Once you have such a community of interest it will not be difficult to influence public opinion, for every merchant in the community likes pick up trade, such as the traveler scatters about. The automotive traveler is a good spender. Usually he demands good goods and is willing to pay well for them. It was our experience that the average merchant was more than willing to wait on the tourist travel and he was quite appreciative.

Once this automotive business group comes to an understanding let there be an earnest effort to eliminate from the operations of that community such things as eight mile an hour speed restrictions, the sneaking, hiding motorcycle policeman

policy, the road obstructions, the unnecessary detour and the messy signboards that serve only to confuse the strange driver.

It is a good suggestion for the automobile man to drive some distance from town and then approach his own community, imagining himself a stranger, and see how badly he might become confused. It is not necessary that the sign on the main corner tell the distance and direction to every hamlet, for most travelers know the larger community to which the road they want to take reaches.

Also have removed from the road the more or less fictitious distance signs. As one drives through many states, it is entirely possible to see signs within 100 yards of each other that vary miles in the announced distance to a given place. Also merchants of all sorts like to put up "danger" signs and so well do they like to put these along the road, that they place them where there is no danger.

There is much to be done in the way of making the trip pleasant for the stranger and the campaign to accomplish this must be a persuasive one. Each of the automotive men who belong to a business organization should make it a part of his personal work to point out to the members of his organization the benefits to be derived from automotive travel.

Correcting Some Evils

After he has pointed out the good points, then he can name the objectionable features and the mere telling of them will cause many of them to be removed. Many of the objectionable distance signs have been put up in ignorance and when the man who caused them to be put up sees the objection, he will cause them to be removed.

It probably will be necessary to use political force to reorganize the sneaking police methods, but automobile dealers in one Illinois city accomplished this last year without much effort. They started their campaign by electing an automotive man as president of as many business organizations as they could, then they turned loose their program of talk and even entered politics against a sheriff who had fines on the brain.

The campaign won and this city is now seeing the result in many more tourists than ever before and there has been no unseasonable increase of traffic difficulties.

Then too, the automotive dealers should realize that there is a handsome profit in catering to the needs of the tourist. Every car owner should be made to feel that his car has a home in every city where that car has a dealer. Quite the opposite feeling is abroad now, whether it is deserved or not.



Certainly the Runwell car dealers of the country are not a unit in letting it be known that they welcome visiting Runwell cars at their place of business.

When such a drive is made, the dealer, gas station man and all others who meet the tourists should know something about the lodging and eating places in their community and be ready to tell the visitor about the prices and quality of accommodations. You have no idea, unless you have tried it, how many such dealers profess ignorance of such accommodations.

Attention to Automobile Clubs

The dealers can then give their attention to the automobile clubs of the country. Dealers should be interested in these clubs because of their power to help the dealer in many ways. As a matter of fact the automotive dealer and owner should



have a common objective in legislation, good roads and general reputation of the town.

It is disclosing no secret when we say that as a whole the automobile clubs have fallen down on the job. They need reorganizing and they need it badly.

This summer the manager of a large automobile club in a large western city had occasion to make a long automobile trip himself. He started out with the information that his club had to supply and this was supplemented by special service obtained when he introduced himself as the manager of a club.

On the return from this trip he immediately set about reorganizing the road service of his club. He said:

"I had no idea what we were sending people out to meet when we gave our advice. From now on, we will know."

The big idea of the automobile club appears to be to get a good looking courteous girl to preside at the information counter. In this way they have been successful and we will go one step further and say that these girls have a more than ordinary share of intelligence. These girls are, as a class, perhaps the best the market affords.

But it is not within reason to expect a busy girl at a counter to know much about roads over which she has never traveled, over which she cannot travel because she must work for a living six days in the week.

Co-ordination Needed

It would appear that many automobile clubs and the state highway departments or whoever has the authority to tear up main traveled roads in the season when the travel is the heaviest, do not work in conjunction. The automobile club system was good in its time, but that time is passed.

As the tourist sees it today, it should be the job of the highway department to post roads so that there cannot be any

mistaking of where the tourist is going. The trouble at present, is that this is being overdone in one sense and not being done sufficiently in another. There are too many confusing and intricate directions, and not enough major signs. It is not necessary to keep the tourist posted as to each mile of his journey, it is much more important that he know that he is on the right road to Washington, Los Angeles, or where ever he is going.

Since the collapse of the highway trail associations, the old signs are going and in most cases a poor job has been done in replacing them.

The automotive dealers should be leaders in a movement to post roads so that he who rides can learn where he is going without having to stop and study the puzzle of conflicting village signs.

The personal freedom in the making and executing of travel plans on the part of the automotive vehicle owner is the biggest asset the automotive manufacturers have in their sales plan today and this phase of the motor vehicle lure should be carefully encouraged.

Every dealer should remember at all times that any car he sells is likely to become a national proposition and the blow that may hurt the resale may come from a distant geographical point. The only way to remedy this situation is to do your part for the other dealers' cars.

It is not unusual to hear a remark like this:

"I like the Runwell car and the service Joe Smith supplies here at home, but when you get out on the road, look out."

The only remedy for this is to remember that your customers may be saying the same thing.

The Welcoming Sign

Just one more suggestion for the local dealer as to his community.

What does the sign at the town limits say?

Is it an insult to motorists?

Or is it one of those welcome signs that put the visitor in a good humor and, of course, in a state of mind where he will drive carefully and have respect for your community and its people. One very pleasing sign that many tourists have spoken of is in use in many eastern towns. It says:

Welcome to Smithville,
Please be careful
of our Kiddies.

Isn't that much better than one like this:

Smithville City Limits,
All drivers exceeding
8 miles an hour will be

PROSECUTED

The automotive dealer who is courteous and fair to the tourist will build for his own future and that of the car that he sells.

23 Years Ago This Week In Motor Age

(From Motor Age of Oct. 25, 1900)

Not So Strange These Days

A strange story comes from Yonkers, N. Y., concerning Frank R. Ford, who, it appears, is blind and yet indulged in the purchase of an automobile some time ago. Despite his affliction he managed to master the intricacies of the machine. Recently he discovered that gasoline vapor was escaping from one of the cylinders, and he determined to repair the leak himself. He went to the barn where the automobile is kept, and as there was a strong wind blowing he closed the doors. After starting the engine he proceeded with his repairs. Ford

says that he had been working about three-quarters of an hour when he suddenly became dizzy and passed into unconsciousness. The exhaust from the engine, with the escaping gas from the cylinder, had overcome him. "There was no strong odor," said Ford, "just the ordinary smell of the gasoline. I was missed from the house some time after and when my people came to search for me they were almost overpowered by the smell of gasoline fumes when they opened the door. They immediately sent for three doctors, and after quite a long time they succeeded in reviving me. When I recovered I felt just as though awaken-

ing from a sleep—no headache, no sickness, or any of the usual accompaniments of gas poisoning."

Interesting Trade Notes of That Time

The Knox Automobile Co. of Springfield, Mass., has turned out its first vehicle, a gasoline voiturette with a single steering wheel in front.

F. B. Stearns & Co. of Cleveland have secured a factory site on Euclid avenue, near the Nickel Plate tracks. The factory will be commodious and equipped with new machinery.

Various New York cities are bidding vigorously for the location of the Remington Automobile Co.'s plant. Indications point, however, to its remaining at Ilion.

Sterling Knight Six Makes Entry Into Sleeve Valve Group

Engine Featured by Seven Bearing Crankshaft. Rubber Shock Insulators Used on Chassis in Place of Shackles. All Models Have 125-in. Wheelbase. Four Body Styles

A RECENT addition has been made to the ranks of the sleeve valve engine by the presentation of the Sterling Knight Six, which, while it follows more or less the conventional Knight design, has several engineering features of its own.

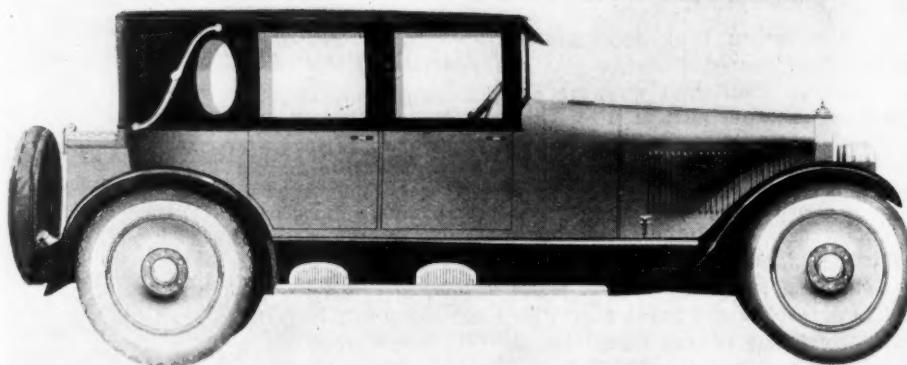
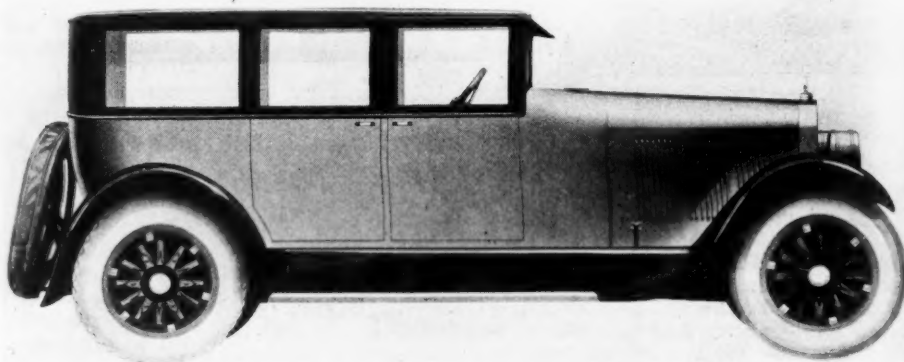
In the body models are found a five-passenger phaeton, four-passenger sport touring, five-passenger sedan and four-door sport brougham. All models are finished in blue, with black fenders. The radiator shell is German silver and the headlamps are full nickel plated.

The engine has a bore and stroke of $3\frac{1}{4}$ by $5\frac{1}{2}$ in. and has the usual two sleeves operated by an eccentric shaft and small connecting rods.

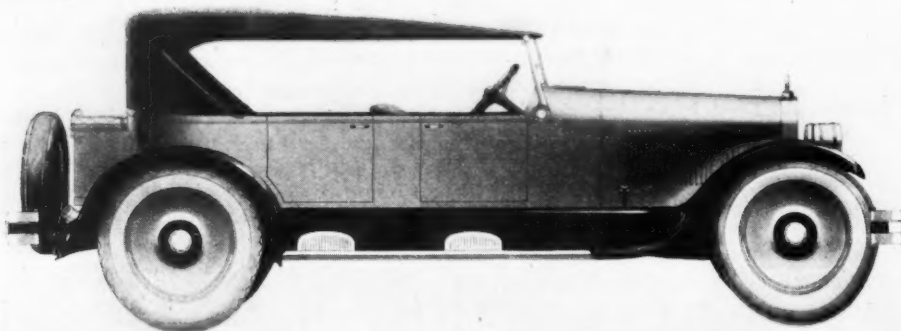
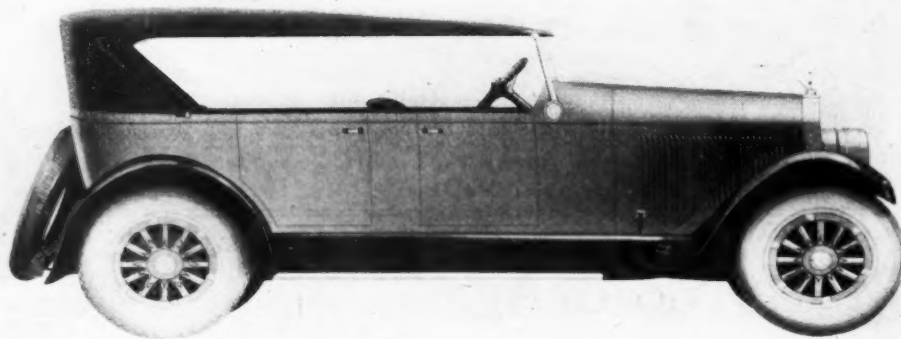
Cylinder Cast in Block

The cylinder block is cast in one piece with an integral cast intake manifold and hot spot. A light type of cast iron piston is used with a floating piston pin. The piston pin is a snug fit, directly into the piston bosses, and takes a bearing on a bronze bushing in the small end of the connecting rod. Oil is fed to this bushing through a steel tube extending along the web of the I-beam connecting rod.

The connecting rod is a steel forging into which the babbitt for the bearing surface is seated directly without the use of brass-lined bushings. It is made with-



Here are shown the five-passenger sedan and the four-passenger sport brougham



The open models of the Sterling Knight include a five-passenger phaeton and four-passenger sport touring

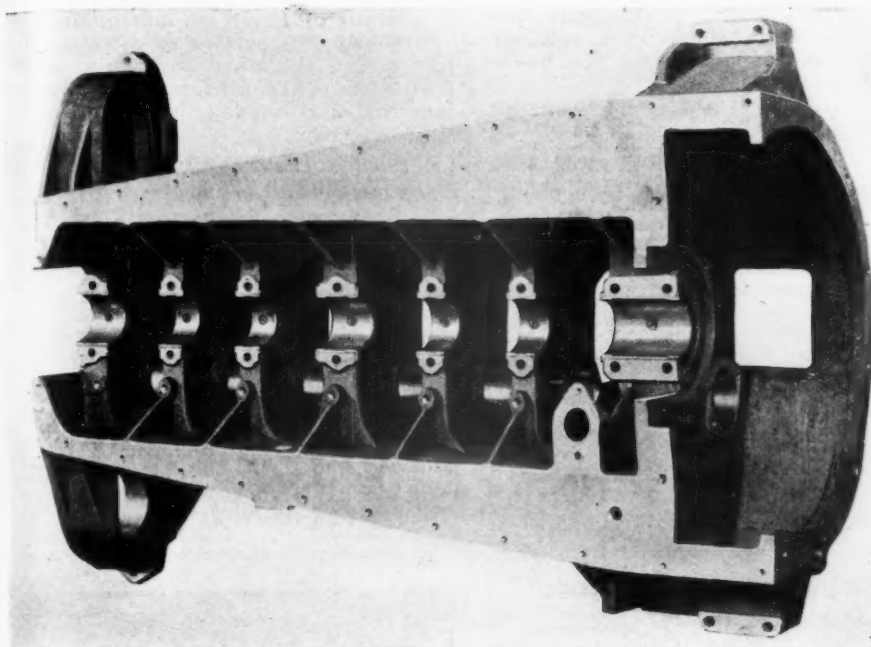
out shims. The construction at the small end of this rod has been designed to eliminate any clamping or locking devices.

Because the only lubricated surface of the piston pin is that part which takes a bearing in the bronze bushing, the pivotal motion takes place at this point. As a result it has been found that the pin itself becomes fixed into the piston bosses. In this way a lock is secured between the pin and piston boss without the danger of any distortion to the piston, it is stated.

How Piston Pin Is Oiled

An additional oiling feature of the piston pin is that the steel tube leading up to it does not enter the bronze bushing but empties into a small, semi-annular groove which is milled in the connecting rod. At approximately 45 degrees apart, two holes are drilled in the bronze bushing which communicate with this groove. These connecting holes permit the oil to enter the bearing in two places, both of which are above the point of maximum pressure, a direct copy of Rolls-Royce.

Both the inside and outside surfaces of the sleeves are ground. The fit or clearance between the sleeves shows a variation nowhere exceeding one-fourth of a thousandth of an inch. The clearance



Crankcase of the Sterling Knight Six, showing the seven main bearings which support the crankshaft. The holes for the cap bolts extend through the webs

between the inner and outer sleeves is .002 in.

The design of the crankshaft is heavy for an engine of this bore and stroke. The $2\frac{1}{4}$ in. diameter pin bearing and the $2\frac{1}{2}$ in. diameter main bearings are so large that they practically overlap.

Crankshaft in Running Balance

The crankshaft is in running balance and the seven main bearing construction is a copy of aviation practice. The bearing caps are steel forgings into which the babbit is directly seated, just as in the case of the connecting rods. These caps are held to the aluminum crankcase by long through-bolts.

Each of the seven bearings in the crankshaft is oiled by a separate oil lead. The use of this oil lead construction is made possible by a very small drilling operation on the crank, whereby each connecting rod is oiled from its adjacent main bearing and communicates to rods oiled from the same bearing. The eccentric shaft also has seven bearings, oiled by seven separate leads.

Oil for the entire system is supplied from a gear driven oil pump located inside of a screen in the bottom of the crank case cover. It provides large screening surface, which is accessible for cleaning from the bottom of the oil pan, without disturbing or taking down the pan itself.

Chain Adjustment Outside

The front end drive is a triangular Morse chain drive. The sprocket driving the accessory shaft is adjusted by a worm and worm wheel mechanism which can be easily operated from outside the engine case while the engine is running.

The engine is equipped with a 12-volt Westinghouse ignition two-unit starting and lighting system. Cooling is by the thermo syphon system.

The clutch is of the multiple disc type (9 discs) with gear-tooth engagements in both driven and driving discs. Adequate provision is made for oiling the throw-out bearing from the interior of the transmission case. The transmission itself is of the conventional three-speed type. From the transmission the drive to the rear axle is through a tubular propeller shaft equipped with flexible disc joints. The clutch operates with a light pedal pressure.

Straight Line Drive

A straight line drive is secured by setting the engine on a slight angle so that the normal drive from the front of the

engine to the rear axle is a straight line.

The rear axle is a Timken, as is also the front axle. The steering connections and links have been worked out to give a small turning radius for a car with a 125 in. wheelbase. Combined with this is a type of steering gear designed to accentuate easy steering. The linkage is arranged to compensate for all deflections of the front spring.

One of the most unusual features of the car, and one which is most quickly noticeable from the external appearance, is the spring suspension, i. e., the use of rubber shock insulators instead of the usual shackle and shackle pin construction.

Rubber Shock Insulators Used

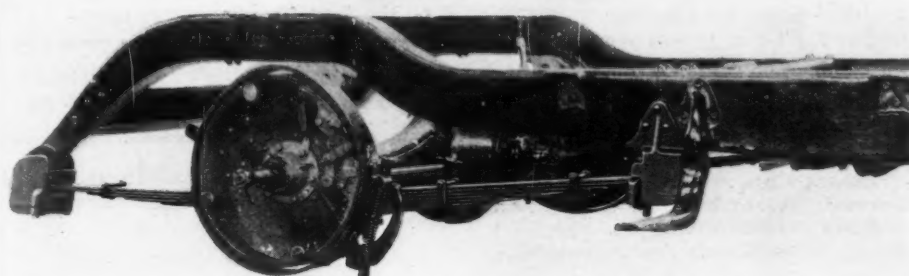
The device consists of blocks of live rubber, located at each end of both front and rear springs. The flexing of this rubber takes the place of the usual pivoting action of shackle and shackle pins. Its use has eliminated any metallic connection between the chassis and road. Because of this fact the riding qualities of the car are materially improved.

The phaeton is upholstered with blue-black Spanish hand-buffed leather in plaited style over davenport type springs. The seat, cushion and back are pitched to insure riding comfort. The upholstery is blind-tacked with no binding or trimming laces.

The five-bow vision top is made of long grained, waterproof, black top fabric. No bows obstruct the view from the rear seat.

In this model the closed car type of windshield has been adapted to open car use by providing two glass windshields with a continuous hinge construction on the top section. The method stiffens the cowl against vibration and rattle.

The instruments are grouped on the dash board of ebony. On this board are the speedometer, clock, dash light, igni-



Rear of the Sterling Knight chassis, showing the method of suspending the springs in rubber shock insulators



Front and rear springs of the Sterling Knight Six. Shackle bolts are eliminated by use of these rubber shock insulators

tion switch, ammeter and oil gage. Ignition and transmission are equipped with locks.

The open cars are fitted with house hair carpets; the closed cars, with Wilton rugs. The floor boards are covered with corrugated rubber, bound with aluminum tee moulding. In the driver's compartment these boards consist of a toe board, running across the car, and the other boards running with the length of the car. This arrangement permits access to the battery by the lifting of but one board without disturbing the entire arrangement of the floor boards.

Equipment Very Complete

On each model is installed a combination tail and stop light and cowl ventilator. The Folberth automatic windshield wiper is included as regular equip-

ment on all models. In the open cars the curtains are placed in a specially designed compartment in the back of the rear seat.

The top of the four-passenger sport car is built to fold down easily when desired. A suit case compartment, fitted with locks and suit cases, is built in on the rear. Straps for carrying additional baggage on the top of the suit case compartment are furnished. In addition to the regular equipment, this sporting type has a spare cord tire and tire cover, front and rear bumpers, windshield side wings, rear view mirror and aluminum toe plates.

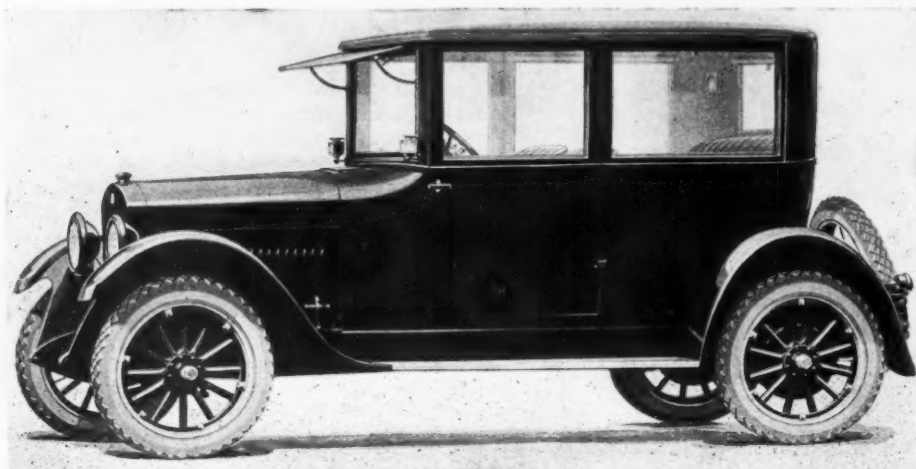
The interior trimming, including the cowl board of the five-passenger sedan, is of polished walnut. The hardware is finished in dull silver. A soft tone broadcloth is used in upholstering the sedan.

Details of Body Appointments

Windows are operated by rotating adjusters and the glass drops flush with the bottom of the window opening. The rear and side windows are fitted with silk roller curtains. There is an outside lock on the right hand front door. The other three doors are equipped with inside locks. The sedan is fitted with a dome light. The padded type of soft roof construction is covered with long grained landau top fabric.

The cowl and interior woodwork of the four-passenger four-door sport brougham is finished in ebony. The interior details of this model are the same as in the sedan, except that the rear quarter windows are small, oval in shape and permanent. A suit case compartment similar to that on the sport touring is built in on this model.

Five-Passenger Coupe New Studebaker Enclosed Model



Exterior of the Studebaker five-passenger coupe. The body is mounted on the Light Six chassis

A Light-Six five-passenger coupe, priced at \$1475 f. o. b., has been added by Studebaker. The doors on this model are hung on concealed hinges and checks

keep the doors in place when open. The auxiliary seat is of the bucket type and can be folded out of the way. Upholstery is in mohair. Hardware is nickel fin-



Interior of the new Studebaker five-passenger coupe. The auxiliary seat folds out of the way

ished. Equipment is complete and a luggage rack adds to the utility of the car.

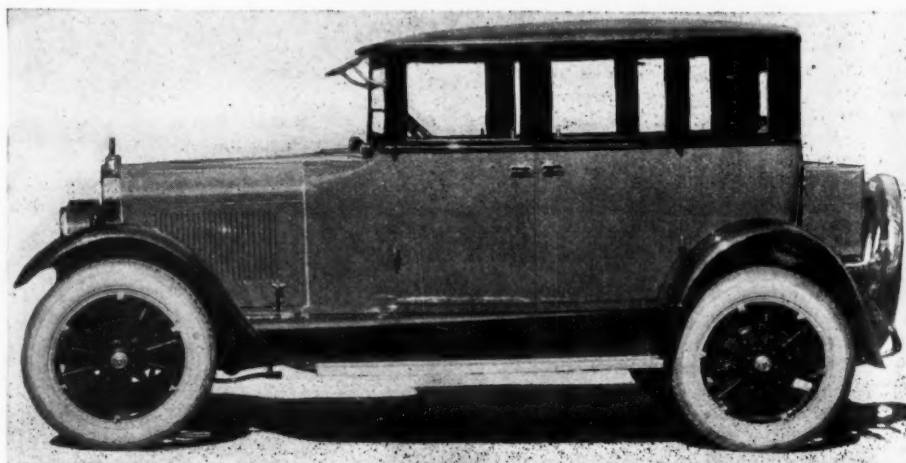
A FOUR-DOOR brougham has been added to the Velie line. It has a full metal covered body, built low. All four doors are full width, providing easy entrance to both seats from either side. Front and rear seats are as wide as the regular sedan.

Door windows operate by rotating lifts. The rear quarter windows may be dropped also.

The upholstery is taupe mohair, with carpets and head linings to match. The equipment includes silver flower vase, vanity case, smoking set, aluminum body rails, mirrors, windshield cleaner, trunk platform, and a trunk with two suitcases, a hat-box, and waterproof cover.

The four-door brougham may be had in either Velie blue or pelican gray color, and is, of course, installed on the standard "58" chassis. This latest model lists at \$1,945 f. o. b. Moline, Illinois, trunk and all included.

Velie Adds a Four-Door Brougham



The model 58 Velie four-door brougham which sells for \$1,945 complete with trunk

Cashing-In on a Reputation

A Small Town Dealer Netted \$6000 Out of His Shop and Car Sales. Shop Well Equipped. Fundamental Reason for Success Is That "Mack" Looked Into Future

ONE year as roustabout and mechanic in a small-town repair shop; two years running a little shop of his own; two more years with a car agency added.

Now, a building of his own on a lot of his own, a well-equipped shop, a nice-looking store with showcases and accessories, and two salesmen helping him sell Dodge cars. Invoice shows \$13,000 property, \$3,000 debt, or \$10,000 net worth. And \$6,000 of this \$10,000 came out of the repair shop and car sales.

H. Metheny, "Mack," earned it all himself, for he started with nothing. He earned some of the \$10,000 outside the motor transportation business, but that doesn't affect the \$6,000 that is directly credited to his repair shop and sales.

This shows steady, constructive work. And it's worth looking into.

The fundamental reason for Mack's advance has probably been the fact that he looked into the future. That's shown in his accepting a humble job to start with, and in Lee's Summit, where he knew everybody, even if Lee's Summit has only 1,500 inhabitants, and is 21 miles from Kansas City, where motorists can get service, accessories and cars. He aimed at a business of his own, after he had discovered that people kept coming back to the garage where he worked and asking for him to do work on their cars. He built a reputation; and cashed in on it.

A description of Mack's garage one week might not answer for the next week, because he is constantly adding improvements in methods or equipment. Let us look at it as he starts his third year. He has not splurged; he has done just about what anybody else, in a small town, with not much money, can do if he works as hard as Mack works, and thinks as clearly.

The Building Investment

The garage stands on part of Mack's residence lot, on a street adjoining the main street of Lee's Summit. The lot is 120 by 124 ft., the cottage occupying one corner. For the repair shop, Mack bought a building, costing \$500 delivered, knocked down. He hired carpentry and other work done in erection, paying for it in labor in his repair shop. The value of his labor thus compensated, was about \$500—his time, not cash, but accounted for as cash. The ground, considering also vacant space to be used for outside storage and for later additions, is worth \$1,000; that's \$2,000 for building and ground, all paid for.

The building has two divisions, one for shop, with part of a second story over it,



H. Metheny of Lee's Summit, Mo., owns this place, and while the establishment is small, its proprietor, a Dodge Brothers dealer, made \$6,000, out of a net worth of \$10,000, on his shop and car sales

and one for office, salesroom and parts stock room. The shop has the usual tool equipment; a Canedy-Otto drill press, which is now operated by hand but adaptable for power operation, a lathe, a No. 310 Little Giant assortment of taps and dies, and a Tungal rectifier for the battery department.

Some "Home-Made" Equipment

A minor item in shop equipment is the wire stretched longitudinally of the battery bench, along which an electric light, hanging from home-made frame, travels on pulleys. A similar traveling light serves the work bench.

A major item of the shop is a traveling crane, also home-made. This is a "two dimensional" crane, that operates across the shop and also from front to rear. Old rails were secured from a defunct "dummy" railroad, and bracketed along the side walls, about three feet from the ceiling. On these rails the framework of the crane travels. The wheels of the frame, that run on these rails, are Ford wheels—four of them, two at each end of the crane frame. Opposite wheels are joined by iron pipe, the pipe being keyed into the wheels, the latter having axles. The body of the crane frame, to which the pipes mentioned are held by arms, is an I-beam. The pipe, being rigidly set in the wheels, rolls in the looped ends of the arms from the I-beam. The tackle element is underslung from the I-beam, traveling transversely of the room on

wheels resting on the lower flange of the I-beam.

With this crane mechanism, an engine can be picked up in any part of the shop and moved to any other part. Or a car standing anywhere in the shop can be manipulated with it.

The shop division of the building has two sections, the rear section containing the work bench, battery bench and crane mechanism, and accommodating three or four cars. The front section has greases and oils, and room for two or three more cars. There is no storage department.

The office section of the building has one room set aside for parts stock. This stockroom, about 10 by 20 ft., has been equipped with bins and cases, for parts and accessories. One side and half the second side have bins built in accordance with the Dodge system of handling parts, with the parts stored here in regular order. New lumber was bought with which to make these compartments and cases, there is no makeshift about them. The room has also bins and small compartments for used parts and for the limited number of Ford parts that the shop carries. These are being further reduced, since local Ford service stations can supply them when needed.

City System in Small Town Shop

The parts stockroom has doors to shop and office; but parts are issued from the office on requisition, and record made. The procedure, in this small shop, in the

town of 1,500, is the same as in a city with a big dealer.

In the office is a cabinet, made specifically to contain such Dodge parts, and a few accessories and supplies, as are most often required for shop work or customers. This cabinet stands against the back wall of the office; the girl in charge of the parts can, by turning, reach the parts, and with one or two steps hand them to a mechanic waiting at the door of the shop.

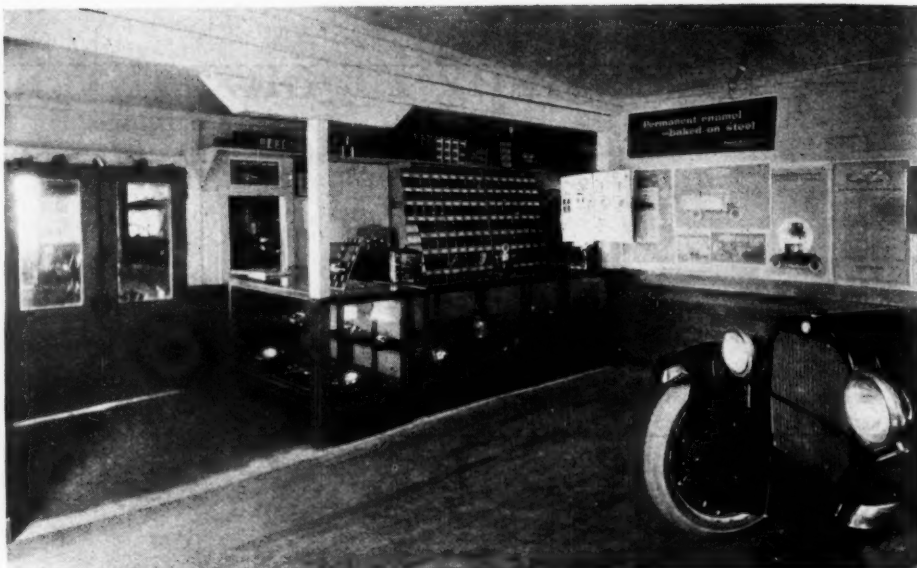
It should be noted here that the girl turns at once to the pin on which shop orders hang, and enters the parts or supplies, given to the mechanic, on the job ticket. Then she turns to the case of perpetual inventory cards, and enters on the cards of these parts the number used in repairs.

The Dodge system of inventory on parts is installed here. It has taken what seemed like a great deal of trouble to invoice the stock, and enter it all on these cards. This might seem to be the sort of "high flying bookkeeping" suitable for a big establishment, but rather "flossy" for a small place. But it seemed to Metheny much more logical here than in a large place where there are more people to keep track of things, and where, perhaps, losses can be absorbed more easily, and where large quantities of parts are carried. It took a great deal of time and trouble to inventory, to effect the distribution of parts into their bins and boxes, and note all of them on the cards. But after that, very little time was necessary to keep track of stock, and there was simplification of the task of keeping the stocks adequate on each item.

Why He Does It

Mack responded to many comments on the extent to which system was being installed here, "You see I haven't time to look after everything myself, and don't want these things on my mind." His time and thought are reserved chiefly for maintenance and car sales. When he is working in the shop, he wants to be able to have a desired part promptly handed to him and he wants his mechanics to devote as much of their time as possible to mechanical work. He doesn't want to spend half an hour or so fiddling around in the parts room, deciding whether he wants some of this or that; and the system will automatically decide the questions as to what should be ordered.

Another reason for improving so far as possible the facilities for handling parts, is that his volume of parts business is growing steadily. He has carried good stocks, and given service, and so more and more classes of people come to him for parts. He sells parts to other garages, not only in Lee's Summit but in towns 25 miles away. Because he can give service, and can be depended upon, he gets this business, which might so easily go to Kansas City, or to any one of a dozen other towns. Garagemen of several towns served by busses touching Lee's Summit have acquired the habit of ordering by phone, for delivery on these busses.



Although humble, this parts department and accessory showcase is the very personification of neatness. It has helped the sales of parts and accessories

It may be interjected here that there is obviously a good spirit of co-operation in this section of Missouri—at least where Mack is concerned. Other repair men serving Dodge cars buy parts of him, and he buys parts for other cars of them—not trying to carry these other parts extensively. The co-operation extends to the sending of work that cannot be handled promptly, from one garage to another, when the customer is willing, and the garage to which the work is sent reports that it can handle the job.

The office proper of the establishment is bounded on one side by the small parts cabinet, on the other by the card index of parts and the showcases. The cabinet stands above a desk. The card index stands on the office safe, where are the daybooks and ledgers. Mack added the showcases recently, when he completed this building, and they are promptly paying their way, through sales of accessories displayed in them. The motor cars on display are in this same room—space for two cars.

Mack's business is built primarily on his maintenance. One reason, apparently, for his success in it is that he never has any quarrels with customers over charges. He uses the Dodge flat rate system, religiously. He also uses the Ford flat rate charges on Ford repairs.

He Knows His Profits

He knows, too, whether the flat rate charge has made or lost him money. For he frequently checks the time of the mechanic on the job. The job ticket has spaces for notation of the hours consumed by the mechanic on each "operation," the charge under the flat rate schedule for this operation, and also space for the rate charged for time work for other than Dodge flat rate schedule operations, which is carried out into the charge column. Reference to this ticket shows whether the Dodge work was done in the scheduled time.

"We make money on some charges, and it keeps us jumping to finish work in

scheduled time on others," he said. The records show that the schedule is fairly well fulfilled in this shop. The job ticket bears record also of parts used and supplies furnished.

The records of the ticket are transferred in detail to a journal; and thence, in totals only, to a ledger. From the ledger the data totals are taken off on a balance sheet. The journal and ledger carry debit items, as well as credit. The Minor & Elland system of bookkeeping is used.

All transactions are, of course, entered on the journal, as well as the maintenance items. Sales of parts, accessories or tires are, like the repair jobs, noted on a cash register; and from the cash register slips, the entries are made in the journal, to be transferred to the ledger.

A Word About Tires

A special word is necessary about tires. Mack does not operate a tire shop; but he does sell tires, tubes and patches. He carries usually 20 or 30 tires, 30x3 to 33x4, the usual sizes for Dodges, and a few oversizes. He always has a few used tires on hand, taken in tire trades, or removed from used cars. Mack uses Red Book price guides for appraising used cars; but he "trades" on the tires.

The difference between himself and a customer in the price asked by Mack for a used car and the price the customer wants to pay is often absorbed in the tires. Several times he has sold used cars without tires, and then sold tires to the customer—or let the customer get his tires elsewhere. There is always a demand for used tires—rather, there is a demand for cheap tires, and Mack prefers to handle used tires, instead of a cheap make of a new tire, or a cut price article.

Mack sells everything at the "regular" price. If the customer hints that he can get an article cheaper elsewhere, the customer is courteously told that he certainly can—but he can't get Mack backing on merchandise elsewhere. The price argument is most often encountered in

respect to batteries, and Mack often wins the sale by mentioning the advantages of buying from him—the inspection, the interest in the customer, the fact that Mack is playing for permanent business and so obviously will be concerned to give full values.

This is a small-town story, a small garage, a small business, a small organization. Wages are small; the biggest thing about the whole thing, is the fact that Mack is making money, and growing.

The organization is small: Mack himself on repairs and car sales; a mechanic, exclusively in the shop, concerned now neither with car nor accessory sales; a boy, helping the mechanic; and the girl in the office. These constitute the payroll—including Mack, who is on salary as manager, a small salary to be sure, but paid regularly. He charges this salary, or wages, because he does do two or three days' work, total, a week in the shop and oversees the establishment. But he makes his bigger money, for his "firm," in car sales. The payroll amounts to about \$225 a month, not counting any monthly compensation to car salesmen, who are on commission only. Rent (he calculates this in overhead, though he owns the ground and building), insurance, advertising, light, heat, telephone, bring the total overhead to about \$320 a month.

The Relation of Maintenance to Sales

During the five months' period, February to June, 1923, 34 per cent of the revenue was from maintenance, and 66 from sales—the maintenance including parts, accessories, tires, and the sales including cars both used and new. It is fairly sure that the percentage of sales over maintenance was larger this year than last. The first year of his Dodge contract, he sold 22 cars; the second year, 46 cars (new), besides 30 used. But the maintenance is climbing steadily, too, proportionately to the sales of cars.

The same five-month period shows on

[illegible]

We often have said in this publication that the shop, no matter how small, should not have a verbal understanding with the customer. Here is the order form used by "Mack"

○

REPAIR TAG No. _____

License No. _____ Date Rec'd. _____

Make of Car _____ Style _____

REPAIRS WANTED

When Promised—Date _____ Time _____

Owner Sign Here _____

Phone No. _____ Phone When Ready _____ **YES**

NO

We state that instructions are clear and perfectly understood.
We agree to the instructions fully. Have this order signed when the car
is left for repairs and, also, when the car is delivered to owner.
Enter all parts and time put in on other side.

CAR RECEIVED

191.

By _____

Mack's Garage, Auto Service
Phone 231-J

AUTOMOBILE REPAIR CHECK NO. _____
PRESENT THIS CHECK WHEN CALLING FOR CAR

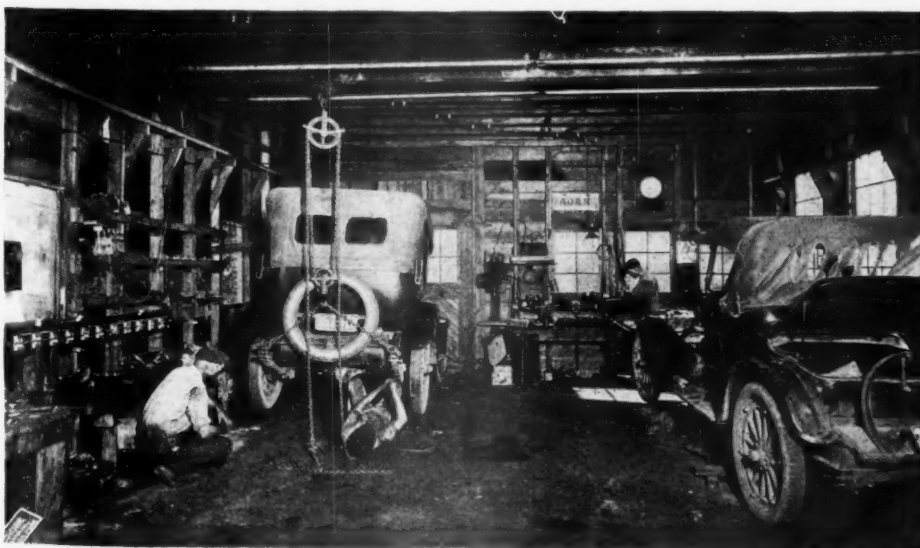
Owner _____

When Promised—Date _____ Time _____

ALL REPAIRS ARE CASH

NOT RESPONSIBLE FOR LOSS BY FIRE OR THEFT

JOURNAL Print. Lee's Summit, Mo.



Here is a view taken in the shop. Note the novel construction of the overhead carrier, which can travel forward and backward as well as across the shop

the books that 82 per cent of customers who buy cars come to him for service. The percentage might be larger, except that Mack sells cars as much as 40 miles from Lee's Summit, and there are many garages in that area seeking the maintenance business, perhaps more conveniently located than Mack's garage.

Mack does not trust to luck, however, to bring these car customers back to the shop. He sends literature every month to his owners, and to prospects; using the Dodge Brothers literature, and also circulars on batteries, tires and accessories.

A bonus system has recently been adopted here, that has already shown results, even in so small an organization. Under this system, a bonus expressed in terms of an extra amount on the weekly wage, is to be paid to mechanic and book-keeper, at the end of the first year; and the weekly factor is added to the weekly wage regularly the second year. At the end of the second year another lump bonus is to be paid, and the weekly wage again increased, and so successively to a certain limit.

Exact analysis might show holes in Mack's system of bookkeeping, and his program; but it must be remembered that he is only in the first stages of his development. He is working some of these things out as he goes along.

Adjustment is necessary, for instance, because he now has two salesmen giving all their time to selling Dodge cars for him. One is a former horse and mule buyer who "knows everybody in 17 counties"; another is the former postmaster of Lee's Summit. They know Mack, they know the car, and they see what he has done.

What the Personal Element Means

The background of Mack's service is part of the influence bringing these two salesmen into the field. The same background, and also the personal equation in Mack himself, produce sales made by persons who have bought from Mack, and who are so enthusiastic that they grab prospects, and practically do all the work on the making of the sales; and get a small commission.

There's another reason that income

will increase on sales; already the former customers are buying their second cars, of Mack. He says there is not a customer to whom he cannot sell such second car, when the time comes.

What sort of a fellow is this Mack, anyhow? What was his preparation for the motor business?

He'd tell you that his college training is his most valuable asset in the shop, handling employes, making sales of maintenance or cars. And the reason is that the college training enables him to think. And the thinker is always one or more laps ahead of the other fellow. The college gave training in the subject of psychology; and also in how to use "psychology." Knowledge of the workings of the mind is useful to the repair man and motor car dealer, in handling each case, with its distinctive character, as it comes up.

If this sounds like theory, take this concrete instance. A customer came with a repair job, a customer of the type that does not think. The customer told Mack what was the matter, and gave instructions as to what to do, and as to the condition that would be found "inside." Mack knew that the customer was mistaken; but he did not tell him so; he did not start an argument. Because this type of man, not being a thinker, could not follow or absorb the argument, he could not visualize the condition of the parts as being different from the condition as he had already pictured it.

So Mack told him to go ahead and dis-

mantle, and then they would see, giving no hint but that he thought the customer right. The customer proceeded happily, expecting to prove his point. When the display was ready, Mack showed the customer where the latter was wrong and the customer could see it.

An insignificant illustration? Quite important; because a non-thinking garage-man might waste an hour or so every day in fruitless arguments with non-thinking customers, when some device like this would secure the desired result of satisfactory service to an unruffled customer. And most of the ruffled customers cease to be customers.

Discounts and Building Credit

The ability to think is also shown in Mack's tendency with respect to discounts. He aims to secure favorable discounts from distributors, and figures out how to do it, and how to make the showing that will do it. The other sort of discount, he aims for also and has so far secured, that is the discount for prompt payment of bills. One of the invariable items in the monthly program is the collecting and listing of statements by the bookkeeper, which are laid before Mack on the eighth of the month. He inspects them, the bookkeeper makes out checks, he signs the checks and the payments are made.

Two other features of Mack's system of paying bills are illuminating. He always transmits at once, check for items bought of concerns not previously dealt with

who ask for payment by return mail. He's building his credit. The other feature is his "slapping down" sizable sums on account of cars, when he happens to be so much ahead, before the due date of payments.

"I might have more money in the bank if I waited for due dates," he said, "but I like the looks of a diminishing debit better than an increasing bank account with the debit unchanged."

Big dealers borrow money frequently; and Mack has borrowed money occasionally. When car sales are humping along, he may need money to finance replacement in his salesroom; or any one of a dozen reasons may require money, since he persists in the policy of taking discounts and paying on the dot. His banker knows every detail of his business, and indeed helps him in the study of the subject of finance and accounting.

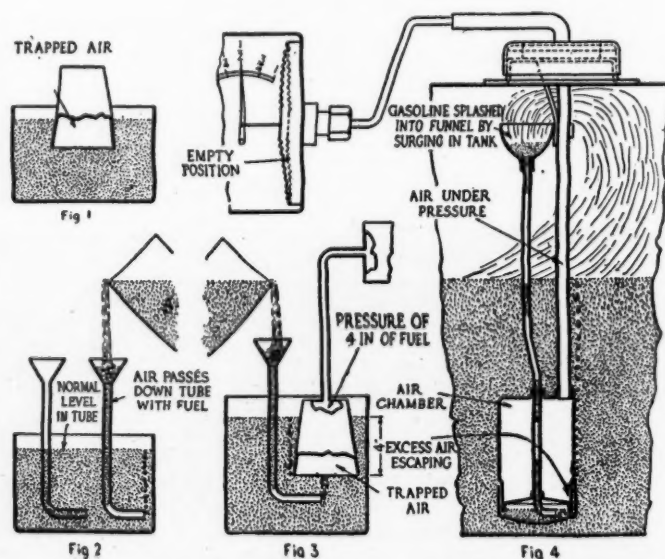
College training did not provide Mack with the ability to grab information on running motor business out of the air. It did give him ability to understand what experts tell him. And he has been perhaps one of the most satisfactory sub-dealers in the Kansas City territory, with respect to accepting and using the assistance and co-operation that the distributor can provide. The Butler Motor Company at Kansas City has given Mack the same close co-operation that it provides for its agents, and Mack has earnestly tried to install both equipment and ideas, and to reflect the spirit as well as the letter of the Butler company's very successful retail example in Kansas City.

A Gasoline Level Gage Controlled by Air Pressure

THE Gaso Scope, a dash, gasoline level gage manufactured by the Gaso Scope Corp. of St. Louis, is now in use as standard equipment on several makes of cars and is said to be under trial by other manufacturers. This gage is actuated by the pressure created in air, trapped beneath a bell in the gasoline tank, the pressure being proportional to the weight of the liquid above the submerged bell. The pressure is utilized to extend a flexible diaphragm and the motion of the center diaphragm is transmitted to an indicator showing the tank level. Air in the bell or trap chamber is replenished by the bubbles carried into the trap chamber by means of fuel which splashes into a funnel at the upper end of a tube leading to the air trap.

The principle and actual construction of the Gaso Scope is illustrated in the diagram herewith. Fig. 1 illustrates a bell or glass inverted in liquid. The glass traps the air and prevents the liquid from entering. The liquid seeking its own level exerts a pressure on the confined air equal to the weight of the liquid above the rim of the glass. Fig. 2—The air pressure created in the glass extends the flexible diaphragm a given distance for a given pressure. Fig. 3—When one body of liquid is poured into another it carries with it a quantity of air which is forced below the surface of the liquid into which the second liquid is poured.

Fig. 4 shows diagrammatically the manner in which the principle is utilized in the Gaso Scope. The tube and funnel normally contain air above the level of the liquid and this air is trapped when liquid is poured or splashed into the funnel, forcing the air down the tube. The air does not pass upward through the tube because of the surface tension of the liquid. The air pressure is always the weight of liquid between the air level in the glass and the air level on the surface of the liquid. This pressure varies as the depth of the liquid varies. The funnel and tube keep the glass full of air. Excess air finds its way around the edge of the glass and escapes to the surface.



Diagrams which illustrate the principle of operation of the Gaso Scope gasoline level gage

Fig. 4 shows this same principle applied with the actual construction of the Gaso Scope. The gasoline splashes into the funnel by the surging of the liquid in the tank. This carries globules of air down the tube into the air chamber. After the air chamber is full, the excess air flows out through the vent. The air under pressure moves the flexible diaphragm, thus indicating the amount of gasoline in the tank.

This Car Dealer Does a \$10,000 Tire Business Yearly With a \$2,000 Stock

Nash and Dodge Dealer in Iowa Town of 4,000 Pays Oil Pump Commission on Sales He Gets by the "Ask 'em to Buy" Method

WHEN O. J. Roberts, a farmer near Knoxville, Iowa, went to Des Moines some twelve or thirteen years ago to buy a new car, the state distributor for the car persuaded him to take an agency in Knoxville territory. That being in the days when automobile sales and automobile service were not so inseparable as they are now, Roberts took the agency and surprised himself by selling eleven cars during his spare time that year.

The automobile inoculation took on Roberts. In 1912 he moved to Knoxville and bought a part interest in the automobile firm now known as Goff & Roberts. In addition to selling and servicing Nash and Dodge cars in a manner that makes many satisfied owners around Knoxville, Goff and Roberts are keen enough business men to know that all of the garage profits are not confined to new car sales or to shop labor.

Balanced Business Pays Best

A balanced garage business, according to their notion, consists of more than a number of good car salesmen and a shop filled with efficient mechanics. They find that, with the same overhead, other avenues of profit are easily opened up.

Until last year, Goff & Roberts had allowed tire sales to take care of themselves. The firm enjoyed a good tire business—thought nothing of it and took for granted that a certain per cent of the tire business done in Knoxville belonged to them. Then the ruinous com-



In a town of 4,000 population, a \$10,000 a year tire business is not a small one, but that is the mark which Goff & Roberts will reach this year

petition began; the garage lost tire customers who were attracted elsewhere by price advertising.

Ways and means of building up the tire department were considered. A tire salesman was invited to sit in at the private indignation meeting. "Put on a retail tire salesman," counseled the tire man. "Pay him \$125 a month and if he doesn't make more than that for you the first month, I'll stand half the loss."

Meeting Ruinous Price Competition

But Roberts thought of an even better plan. His son was home from college

for the summer and was looking for something to do. "Take charge of the oil pump and the tire sales this summer," Roberts told him. "I'll pay you a commission on oil, gas and tires." Ten per cent of the retail price of the tires was to go to the boy.

One thousand hand bills were printed and distributed among the cars on the streets. A series of advertisements was run in the local newspaper. Roberts was fortunate in having the franchise for a tire that gave him a low-priced product to offer as well as a higher grade tire of the same make. The low prices were stressed in the advertising, not because Roberts believes in cut-rate selling but to draw in prospects so that salesmanship could be used on them.

The intensive campaign to sell tires was begun in July. The first month showed some gain in the volume of tire business but it was not until the second month that results really began to show. The tire business done during the second month was three times larger than that of the preceding month. During September \$1,400 worth of tires was sold by Goff & Roberts.

"Tires Must Be Sold"

And this brings Goff & Roberts to the conclusion that "tires must be sold as anything else is sold. The tire business goes to the man who 'asks 'em to buy.'"

Despite the price advertising, Goff & Roberts do not believe in featuring the low-priced tire in anything but their advertising. When a customer is brought in by price advertising, Roberts tries to



"The large display window opening onto the drive at the filling station was decorated with suitable tire displays"

use salesmanship to sell the higher-priced quality tire.

"It's not salesmanship when price influences a customer's decision," says Roberts. "People as a rule want quality merchandise and are willing to pay a higher price for it provided that someone takes the trouble to show them the difference in construction between the higher grade tire and the cheap one."

As a result of such reasoning and sales effort, two-thirds of the tires sold by the garage, aside from the 30 in. sizes, are of the higher-priced types. The results of Goff & Roberts should give the lie to assertions that it is impossible to sell quality tires under present conditions. The tire business waits for the man who goes after it.

The boy at the oil station made as high as \$175 per month on his commissions. Every car that called at the station was inspected for tires that might need replacing. If no spare was carried, the customer was invited to invest in some "trouble insurance." If he didn't want a tire just at that time, he was asked to call and look over what Goff & Roberts had to offer before purchasing his next tire.

When the boy was not busy at the gas pump, he was scouring the town for unlikely-looking tires. The large display window opening onto the drive at the filling station was decorated with suitable tire displays. Aside from the personal solicitations of the boy, every one in the garage was on his toes to sell tires.

The Shop Sells Tires, Too

The shop has been able to turn in considerable business in to tire line. Every car that comes in at the service entrance is inspected by Roberts and badly worn tires noted. When the customer calls to pay his repair bill, Roberts points out the need of the new tire. In many cases a sale is effected by the simple method of asking a customer to purchase.

In talking quality merchandise to the

cut-rate shopper, Roberts does not rely entirely on word of mouth. Sectioned samples of tires on the show cases are not only kept there for the casual examination of the curious, but are actually used in explaining the difference in tire construction. Roberts sells quality whenever possible because he knows that the customer will be better satisfied and that one satisfied customer will bring another car owner into his garage.

"People like to think that their custom is appreciated," says Roberts. "They will patronize the man who asks them to buy and who sells them a worth-while product at a reasonable price."

Profits, Not Volume, Count

"Every man dealing in tires is entitled to a reasonable margin of profit; he is simply cutting his own throat when he cuts his profit to make a sale. A volume of business means nothing unless the books at the end of the year show a fair return on the investment. The tire department of a garage is not an insignificant item if it is properly handled. Tires must be sold now-a-days."

Believing that the ordinary garage cannot afford to invest in complete stocks of two different kinds of tires, Roberts handles but one make. The stock of tires carried by the company averages around \$2,000, giving an ample assortment in the sizes and types ordinarily called for by customers. Stock can be replenished quickly from the branch of the tire company at Des Moines.

"We should do around \$10,000 in tire business yearly," adds Roberts. Considering that Knoxville has a population of but 4,000, the quota that Roberts has set is not small. It might be well to add that, at the present rate of doing business, Goff & Roberts will make their quota by the end of 1923.

Their plan of getting the tire business is very simple—just going after it and asking for it.

DAWZ DIARY

OCT. 25—Me and Art likes to talk about the place we are going to have when we go in bizness for ourself me thinking the way it looks now thats about as near as well ever get, but even at that it dont do no harm to talk it over and get our ideas settled.

Art thinks that if we have a good shop, that will keep us bizy but i got an idea that a fellow had ought to work all the angles he can to make some money.

Of course Art is a natural born mechanic and cant see nothing eltse except mechanical stuff but i think i got a good idea of making a little coin selling stuff wich is a lot easier than repairing cars and it strikes me that where 2 guys is going into bizness together they ought to run different departments then they isent any chanct to get gelus over the same job and to skrap over who has got the most to say.

When each guy has a job of his own its up to him to take care of it and not bother the other fellow and if he cant make his job make money then the other fellow had ought to help him insted of skraping with him and telling him he aint no good. Sometimes one guys job is harder than the other and they aint so much money in it anyway thats why i want to have a store along with the shop sos when the shop aint got much work the store will help out me thinking that eggs in two baskets is better than one the only truble is getting the eggs wich i wish i had a goose that would lay gold ones like they has in storys.

DOING ONE THING WELL

THE service station can learn many a lesson from other lines of business. Take the case of a grocery store.

The other day a woman drove to this store and ordered a lot of things, among them a basket of peaches. The clerk carried all the things out to her car and she drove home. She had hardly gotten home when the store called her and told her that they had forgotten to put the basket of peaches in the order. She said she would be coming to town in a short while and would call for them.

She drove up to the curb in front of the store and had hardly stopped her car when the clerk was out with the basket of peaches. He had been on the lookout for her even though he was waiting upon other customers. He expressed his regret that the peaches had not been put with the order. He fixed things up so that the woman left with a smile and entirely pleased.

Now, the point we would like to make is that too often in the service station our attendants are not on the lookout for the customer as was the grocery clerk. Mistakes will happen in the service station just as they will in any other line of business, but let's make sure we are on the job to take care of the customer so he or she will leave in as happy a state of mind as did the woman in the above instance.



A closeup of the window shown on the opposite page. This window, as well as every employe, is always "on its toes" to "ask 'em to buy"

Flat Rate Is More Than Fair for the Mechanic

A Workman's Efficiency Varies Directly According to the Amount of Incentive Supplied by the Employer. By Establishing a Flat Rate Within the Owner's Flat Rate the Mechanic Can Look Forward to Better Pay. Two Compensation Plans That Raise Self Respect for the Workman and Earnings For the Dealer

By PAUL DUMAS

Preceding articles in this series were published on June 21, July 12, August 2, August 23, September 13 and October 4, 1923.

THE Time and Material system of selling automobile repairs has some weaknesses that are too inherent to be remediable. Perhaps the worst is the lack of confidence and understanding that exists between the parties concerned, owner, employer and workman. Forgetting the car owner for the instant, this is about the way the thing sums up between mechanic and employer:

As the Dealer Sees It

The dealer states that he can't get good mechanics at any price. If he does finally hire one he finds that after a period of satisfactory service the mechanic is inclined to get temperamental. Temperamental workmen require careful handling and work efficiently only when they feel so inclined. When the dull season comes he can't afford to keep him on the payroll, and he can't afford to lose him by giving a layoff.

Some of the men he hires are fairly good workman but they misuse his shop equipment. Comeback jobs are his funeral but the mechanic needn't worry, he gets his pay just the same. Now understand this is the dealer's story, the man who hires and pays the mechanic.

What the Mechanic Says

Let's hear what the really good mechanic has to say regarding the repair business as he sees it.

"My name is John Campbell. I've been working on cars now for about 12 years. I admit that I don't know everything about an automobile but I can take care of myself with the best of them. I haven't been fired from a job since my first two years in the game but I don't seem to be getting anywhere. Now, I've worked in a lot of shops but the thing I can't figure out is why some of these young birds can knock the boss off for as much jack as I'm getting, and me turning out more good work than any of them.

"Bill Rumley, my last boss, was pretty good on that proposition, giving me all the engine work, and paying me ten cents an hour more than the guy next to me. Bill was paying me 80 cents an hour and I told him I'd have to get 90 and he said he just couldn't afford that much, so here I am. I wouldn't have quit Bill except that I figured he was making 45 cents an hour off me without doing a tap. I'm always on the job but there was Bill getting a dollar and a quarter an hour from the owner and say-

ing that he couldn't afford 90 cents an hour on account of expenses. Think I'll go railroading or get some guy to put up the jack and start a shop of my own."

A New Point of View

We are growing wiser every day regarding this Maintenance proposition and the last four years have seen a lot of badly needed improvements. As a matter of fact we have accomplished more in the last three years than all the time previous. There has been a change in attitude.

The dealer who hires mechanics has learned to look on his workman as something more than a mere greasemonkey. The Mechanic more fully realizes that the lot of the Boss is not all velvet and roses. Lastly with the coming of Flat Rate the Public has grown to regard the dealer and mechanic as something better than gamblers and animated monkey wrenches respectively.

Right now in the establishments where Flat Rate has been used for two or more years we find that mechanic and employer have practically settled their differences. It has been brought about by carrying Flat Rate to its logical point of development, by the adoption of the **BONUS AND PIECE WORK SYSTEM**. Neither one of these Compensation Plans has anything to do with Socialism or Sovietism.

They are merely the CREATION OF A FLAT RATE WITHIN THE FLAT RATE AS APPLIED TO THE CAR OWNER. Because the idea is somewhat new in the Maintenance Business some dealers and some mechanics haven't recovered from the shock sufficiently to investigate its merits. Before we go into detail regarding the specifications of these Compensation Plans, we will first outline what these plans actually accomplish.

For the Dealer

With the Flat Rate Mechanics Compensation system the dealer is assured that

The responsibility of a repair job rests on the proper shoulders.

He pays his men only for results produced.

His floor space is efficiently utilized. His men are inclined to do better work.

His shop equipment is not abused.

Loading is entirely eliminated.

Volume is increased without a proportionate increase in overhead.

His employees will actually solicit repair work for the shop.

For the Employee

The big thing that was always missing under the old system of doing business was INCENTIVE. That is why many good mechanics take a sometimes disastrous flyer at starting an "Alley Shop". It also explains why many of them give up the trade entirely. The Flat Rate shop has improved working conditions, and now Flat Rate Compensation offers an incentive. Among other things the mechanic is assured that

He receives pay according to his ability to produce.

The use of his head relieves his hands and fattens his pay envelope.

A slighted job is his own funeral.

His experience is worth money.

Special purpose tools are his best friends.

The more work he brings into the shop the more money he will take home.

That there is always a better and quicker way to do the job in hand.

The Bonus System

Of the two Compensation Plans the Bonus System is perhaps better suited for the small sized establishment. It is also applicable to the larger sized metropolitan distributor where it is often used in conjunction with the Piece Work System. When used in these institutions its purpose is to take care of Testers, Foremen and Inspectors. In its simplest form the Bonus System is just this:

The car owner has sent his automobile in for certain repairs that according to the Flat Rate Schedules sell for \$12, the equivalent of 8 hours at \$1.50 per hour. Now if the mechanic is able to complete the repair in 7 hours he is given pay for the hour saved. Should he accomplish the job in six hours he still receives pay for eight hours, thus making it possible to turn in a Time Sheet for 10 hours or better in an eight hour day.

Bonus System No. 2

There are many modifications of the above plan but in principle they retain the same fundamentals.

For instance, in a certain large maintenance establishment, the Bonus System is used exclusively. There are of course Testers, Inspectors and Foremen plus several mechanics. All mechanics are hired at a certain hourly rate depending

(Continued on page 24)

Operation Schedules—Chassis Section—Rear Axle

These schedules embrace the three types of passenger car axles. The operations No. 70, No. 71, and No. 70-71 are of use for all general chassis overhauling and should be referred to when work on the engine or transmission necessitates the removal of the rear axle assembly.

MAXWELL			PAIGE 6-06 AND JEWETT		
Operation No. 70	REMOVE ONLY Rear axle assembly. MATERIAL None.	1 hr.	REMOVE ONLY rear axle ASSEMBLY. MATERIAL None.	Operation No. 70	1½ hrs.
Operation No. 71	INSTALL ONLY Rear axle assembly MATERIAL None.	1 hr.	INSTALL ONLY rear axle ASSEMBLY. MATERIAL None.	Operation No. 71	2½ hrs.
Operation No. 72	OVERHAUL AXLE ASSEMBLY. Includes removal and installation of assembly on car. Includes renewal of all parts required. MATERIAL Gears Bearings Grease Gaskets	5 hrs.	OVERHAUL REAR AXLE ASSEMBLY. Includes same as Hudson or Maxwell. MATERIAL Same as Maxwell.	Operation No. 72	12 hrs.
Operation No. 73	INSTALL differential carrier assembly. Includes removal of both axle shafts. MATERIAL None.	1 hr.	INSTALL ONE AXLE SHAFT. Right or left. MATERIAL Axle shaft.	Operation No. 81	1½ hrs.
Operation No. 74	INSTALL differential carrier assembly. Includes installation of both axle shafts. MATERIAL None.	1 hr.	REMOVE AND INSTALL NEW RING GEAR AND PINION. Includes same work as Hudson. MATERIAL Same as Maxwell.	Operation No. 78	7½ hrs.
Operation No. 75	OVERHAUL DIFFERENTIAL by removing differential and carrier assembly. Includes renewal of ring gear, pinion, differential gears or case, or bearings. Adjust gears. MATERIAL None.		ADJUST AXLE GEARS. MATERIAL None.	Operation No. 76	1½ hrs.
Operation No. 76	ADJUST GEARS. Includes removal and installation differential carrier assembly. MATERIAL None.	4½ hrs.	OVERHAUL 4 AND WILLYS KNIGHT Model 20 and Later OVERHAUL REAR AXLE ASSEMBLY. Includes same work as Maxwell or Hudson operation.		
Operation No. 77	REMOVE AXLE HOUSING COVER, wash out, check gears and fill with fresh lubricant. MATERIAL Lubricant.	2½ hrs.	MATERIAL Same as Maxwell. INSTALL only REAR AXLE ASSEMBLY. None.	Operation No. 71	12 hrs. 14 hrs. 2½ hrs. 5 hrs.
MAXWELL RECOMMENDATION IS THAT PINION AND RING GEAR BE ADJUSTED BY REMOVING DIFFERENTIAL CARRIER ASSEMBLY FROM AXLE. ADJUSTMENTS ARE MADE ON THE BENCH.			REMOVE only REAR AXLE ASSEMBLY. MATERIAL None.	Operation No. 70	1 hr. 2 hrs.
			INSTALL ONE REAR AXLE SHAFT. MATERIAL None.	Operation No. 81	5 hrs. 2½ hrs.
			MATERIAL Axle shaft STOP ALL AXLE GREASE LEAKS. Washers. Washers.	Operation No. 81G	4 hrs. 5½ hrs.
			(Willys operation includes burning off brakes.)		
LINCOLN					
Operation No. 70-71	REMOVE and INSTALL rear AXLE ASSEMBLY. MATERIAL None.	8 hrs.			

STUDEBAKER—Models Big, Special and Light Six		
Operation No. 78	INSTALL NEW RING GEAR AND PINION. Includes adjusting. MATERIAL Gear and pinion. ADJUST AXLE GEARS. Includes removal of carrier assembly. None. INSTALL ONE AXLE SHAFT. MATERIAL Axle shaft.	10 hrs.
Operation No. 76	OVERHAUL DIFFERENTIAL. Includes overhaul of differential gears and bearings and diff. case. NO WORK IS DONE ON PINION OR RING GEAR. MATERIAL Gears. Bearings. Gaskets. Lubricant.	8 hrs.
Operation No. 81	ADJUST END PLAY IN AXLE SHAFTS. Includes same work as Hudson operation. MATERIAL Grease retainers.	1½ hrs.
Operation No. 758	ADJUST END PLAY IN AXLE SHAFTS. Includes same work as Hudson operation. MATERIAL Grease retainers.	10 hrs.
Operation No. 84	ADJUST END PLAY IN AXLE SHAFTS. Includes same work as Hudson operation. MATERIAL Grease retainers.	2 hrs.

ADJUSTMENT OF RING GEAR AND PINION ON STUDEBAKER IS ACCOMPLISHED BY REMOVING ENTIRE CARRIER ASSEMBLY MAKING ADJUSTMENTS ON BENCH.

DORT—4 Cyl. Models

Operation No. 72	OVERHAUL REAR AXLE COMPLETE. Includes same work as Maxwell. MATERIAL Same as Maxwell.	9 hrs.
Operation No. 78	INSTALL NEW RING GEAR AND PINION. MATERIAL Pinion and ring gear.	7 hrs.
Operation No. 79	INSTALL NEW DIFFERENTIAL case WHEN AXLE IS DOWN FOR RING GEAR OR OTHER WORK. MATERIAL Differential case.	1½ hrs.
Operation No. 80	TAKE PLAY OUT OF REAR MEMBER. AXLE NOT DOWN. Same as No. 80 when axle is DOWN.	3½ hrs. 1½ hrs.
Operation No. 80D	MATERIAL None.	
Operation No. 81	INSTALL NEW AXLE SHAFT, right or left. MATERIAL Axle shaft.	4% hrs.
Operation No. 76	ADJUST REAR AXLE GEARS. Includes washing out and adding new lubricant. MATERIAL None.	2 hrs.
Operation No. 82	REMOVE both REAR WHEELS. Includes removal of grease. MATERIAL None.	2 hrs.
Operation No. 83	INSTALL new PROPELLER SHAFT OR BEARING. MATERIAL Shaft or bearing.	4 hrs.

DODGE—All Models		
Operation No. 70-71	REMOVE AND INSTALL REAR AXLE ASSEMBLY. MATERIAL Full floating type Semi floating type	3 hrs. 3 hrs.
Operation No. 72	REMOVE AND INSTALL REAR AXLE ASSEMBLY FOR OVERHAUL PARTS DISASSEMBLED ARE subject to new replacement providing the same time can be installed within the same time as required in replacing old parts. MATERIAL Same as Maxwell. Full floating Semi floating	8 hrs. 7 hrs.
Operation No. 81	INSTALL ONE REAR AXLE SHAFT. MATERIAL Full floating	1½ hrs. 1½ hrs.
Operation No. 78	INSTALL NEW PINION AND RING GEAR. MATERIAL Full floating Semi floating	7 hrs. 4½ hrs.
Operation No. 88	Ring gear and pinion. STRAIGHTEN TORQUE TUBE and install PROPELLER SHAFT BEARINGS. MATERIAL Full floating	11 hrs. 11½ hrs.
Operation No. 76	ADJUST AXLE GEARS. Semi floating MATERIAL None.	2½ hrs.

FORDSON TRACTOR

Operation No. 72	OVERHAUL REAR AXLE ASSEMBLY. MATERIAL Same as Maxwell.	6 hrs.
Operation No. 78	INSTALL WORM AND GEAR. MATERIAL Worm and gear.	4 hrs.
Operation No. 86	REMOVE AND COMPLETELY DISMANTLE FOR INSPECTION. MATERIAL None.	3 hrs.
Operation No. 78	INSTALL NEW RING GEAR AND PINION. Includes true up gear carriers and drive shaft and adjust gears. MATERIAL Same as Maxwell.	11 hrs.
Operation No. 87	INSTALL NEW DIFFERENTIAL BEARINGS. Requires removal of axle and includes adjusting of gears. MATERIAL Bearings.	5½ hrs.
Operation No. 76	ADJUST AXLE GEARS. Includes washing out and adding new lubricant. MATERIAL Lubricant.	2½ hrs.

CHEVROLET—490 and SUPERIOR Models		
Operation No. 70-71	REMOVE AND INSTALL REAR AXLE ASSEMBLY. MATERIAL None.	1½ hrs.
Operation No. 72	OVERHAUL AXLE ASSEMBLY. Includes same work as Maxwell operation. MATERIAL Same as Maxwell.	5 hrs.

FORD—Model T and Ford Truck

Operation No. 72	OVERHAUL REAR AXLE ASSEMBLY. MATERIAL Same as Maxwell.	4 hrs. 8 hrs.
Operation No. 71	INSTALL only REAR AXLE ASSEMBLY. MATERIAL None.	1½ hrs. 4 hrs.

(Continued from page 21)

on their reputation and experience. The hourly rates vary from 50 to 85 cents for mechanics. Flat Weekly Salaries are paid the Inspectors, Executives, etc. However every man actually connected with the Repair Department shares in the Bonus plan.

The Repair Department office keeps a record of the number of "Hours sold" during the month. If 2000 hours labor have been sold which required only 1800 hours to accomplish, the whole organization shares in a bonus of 200 hours. Each man is given a bonus to the extent of half the number of hours he has saved, the other half is divided among all others in the organization.

One good feature of this sort of Bonus Plan is that an incapable or lazy mechanic is soon found to be a burden on the other men who will of themselves see that he is stricken from the payroll. On the other hand when any one of the men is up against it on a difficult job the others are inclined to go to his assistance. The whole shop must exceed the Schedule time before any individual is entitled to his personally earned Bonus. This produces a fine spirit of teamwork.

Bonus System No. 3

This is a plan originally inaugurated by a number of Dodge dealers and used successfully by some of them even today. A mechanic works 200 hours in May, producing \$300 worth of gross work. He receives 40 per cent of the gross return or \$120. By dividing the number of

hours worked (200), into the amount paid (\$120), you set his hourly Flat Rate, 60 cents, which will hold during the following month.

This rate can change monthly. If during the next month (June) he produces \$450 gross for 225 hours work, his hourly rate for July will be 40 per cent of \$450 or \$180 divided by 225, or just 80 cents per hour.

Piece Work

This plan is very popular in some sections of the country, and especially in the metropolitan districts. It is nothing more than paying the mechanic a certain set price for a certain Flat rate operation.

Generally speaking the amount paid the mechanic is a certain fraction of the selling price of the job to customer. The value of this fraction varies in localities and is never lower than 30 per cent and seldom higher than 50 per cent. These fractions apply to labor only and where the operation involves the use of expensive special shop equipment the percentage is lowered.

The Piece Work Plan is heartily recommended where the volume of work done is sufficient to insure a steady income for the workman. It is a great developer of new and better methods on the part of the mechanics. More work is accomplished with less man power and consequently overhead is reduced as compared to the straight hourly system.

There are pitfalls however for the dealer who strives for a big price re-

duction to the owner by slashing the time limit. Another point to be considered with the Piece Work Plan is payment of Testers, Inspectors, and other non-productive Executives. It is not difficult to picture the delicacy of a situation where the mechanic receives more pay than the man who puts the O. K. on his work. Nevertheless we know of one firm that paid Inspectors a weekly salary of \$40 while mechanics in the same shop were making as high as \$65 per week on Piece Work.

Everyone Benefits

The proof of any pudding is in the eating and the dealers who have used these Compensation Plans have achieved tangible results. Earnings have been increased for both the dealer and mechanic and labor turnover is practically nil. With these benefits to dealer and mechanic there has been no increase in the cost of Maintenance to the owner.

The future probably will see a further betterment of conditions and a closer approach to something like standardized Maintenance. It has long been an admitted fact that the cost of Maintenance was too high compared to the cost of the new vehicle. Common sense business tactics such as the industry is now practicing will put Maintenance on its own feet. The future car may be sold with a certain mileage guaranteed at a certain Flat Rate cost of Maintenance per mile.

NEXT INSTALLMENT: "WHAT SOME DEALERS THINK OF PIECE WORK AND THE BONUS PLAN."

PACKARD—Models 116, 126 and 133		
Operation No. 89	TORQUE ARM REAR END BUSHING—REBUSH. MATERIAL	2½ hrs.
Operation No. 89PT	INSTALL Torque arm REAR END PIN AND Model 116 BUSHING. MATERIAL	2½ hrs.
Operation No. 90	Pin and bushing. REMOVE AND REPLACE BOTH rear WHEELS. MATERIAL	2¼ hrs.
Operation No. 89	None. REMOVE AND REPLACE ONE REAR WHEEL. MATERIAL	1 hr.
Operation No. 81	None. INSTALL ONE REAR AXLE SHAFT. When WHEELS are removed for other work. MATERIAL	1¼ hrs.
Operation No. 78	AXLE shaft. INSTALL new RING GEAR AND PINION. MATERIAL	1¼ hrs.
Operation No. 75P	Ring gear and pinion. REMOVE DISMANTLE REPORT and REPLACE DIFFERENTIAL ASSEMBLY. MATERIAL	12 hrs.
Operation No. 76	None. ADJUST AXLE GEARS. MATERIAL	2 hrs.
HUDSON SUPERSIX AND ESSEX		
Operation No. 72	OVERHAUL REAR AXLE ASSEMBLY. Includes complete overhaul of rear axle, including brakes which are to be adjusted but not relined replacing all parts necessary to put axle in good shape. MATERIAL	8 hrs.
Operation No. 70	Same as Maxwell. REMOVE ONLY rear axle assembly. MATERIAL	1 hr.
Operation No. 71	None. INSTALL ONLY rear axle assembly. MATERIAL	1 hr.
Operation No. 78	RENEW RING GEAR, PINION GEAR, BEARINGS AND CUPS. Includes replacement of ring gear, pinion gear, bearings and bearing cups where necessary. No work to be done on differential assembly. MATERIAL	6 hrs.
Operation No. 84	Same as Maxwell. ADJUST END PLAY IN AXLE SHAFTS AND RENEW FELT WASHERS, AXLE SHAFTS IF NECESSARY AND AXLE OUTER BEARINGS. MATERIAL	1 hr.
Operation No. 85	Felt washers. Axle shafts. REPLACE AXLE SHAFT HOUSING (right or left tube) Includes removal of differential carrier, remove axle tube or housing; install and rivet new tube. MATERIAL	7 hrs.
Operation No. 76	AXLE housing tube. ADJUST RING GEAR AND PINION. MATERIAL	2 hrs.

Enclosed Auto Show

Coliseum October 13 to 20

OPEN FROM 10:00 A. M. TO 10:30 P. M.
(Sunday Excepted)

Blended colors—gleaming panels, hooded power waiting the open road—the Enclosed Auto Show! Here you can peer into the crystal of the future. Here makers of 1924 have assembled the technique of 1924 for your preview. Children of America's engineers show new mechanical mastery; the new fashions for every phase of the car of each heart's desire—sit at the wheel of yours!

CHICAGO AUTOMOBILE TRADE ASSOCIATION

A peek into 1924

Enclosed Auto Show

Coliseum October 13 to 20

OPEN FROM 10:00 A. M. TO 10:30 P. M.
(Sunday Excepted)

Closed Automobiles Priced From \$650 to \$15,000

CHICAGO AUTOMOBILE TRADE ASSOCIATION

A peek into 1924

WHY WAIT till next year?

?

THE ENCLOSED AUTO SHOW COLISEUM NOW!

Open 10 A. M. to 10:30 P. M.
October 13 to 20
Admission (222) 75c

Enclosed Auto Show

Coliseum October 13 to 20

OPEN FROM 10:00 A. M. TO 10:30 P. M.
(Sunday Excepted)

A march stolen on Time, a lifted lid on motordom's treasure chest for 1924—the Enclosed Auto Show! The last words in comfort spoken by America's master engineers in motor car expression—the final pronouncements in chassis innovations. A summons to all the clans of motoring to witness a year's strides in all-season utility and convenience. Thousands are there—seeing and being seen. Prices are from \$650 to \$15,000. Be there yourself—today!

CHICAGO AUTOMOBILE TRADE ASSOCIATION

A Peek into 1924

Enclosed Auto Show

Coliseum October 13 to 20

OPEN FROM 10:00 A. M. TO 10:30 P. M.
(Sunday Excepted)

Enclosed Automobiles priced from \$650 to \$15,000

CHICAGO AUTOMOBILE TRADE ASSOCIATION

A peek into 1924

LAST DAY to see

ENCLOSED AUTO SHOW COLISEUM NOW!

Open 10 A. M. to 10:30 P. M.
October 13 to 20
Admission (222) 75c

CLOSED but OPEN

The ENCLOSED AUTO SHOW COLISEUM NOW!

Open 10 A. M. to 10:30 P. M.
October 13 to 20
Admission (222) 75c

The promise of 1924 for the Today, beauty in a hundred new fresh masteries in many modern closed Auto Show! The finest of every maker of fine motor cars yet disclosed—the final accomplishment of America's artisans in transportation. In this assemblage you will find enclosed cars for every purpose and pocketbook—priced from \$650 to \$15,000—flanking each other for your preview. Chicago is flocking to this closed car congress. Come!

CHICAGO AUTOMOBILE TRADE ASSOCIATION

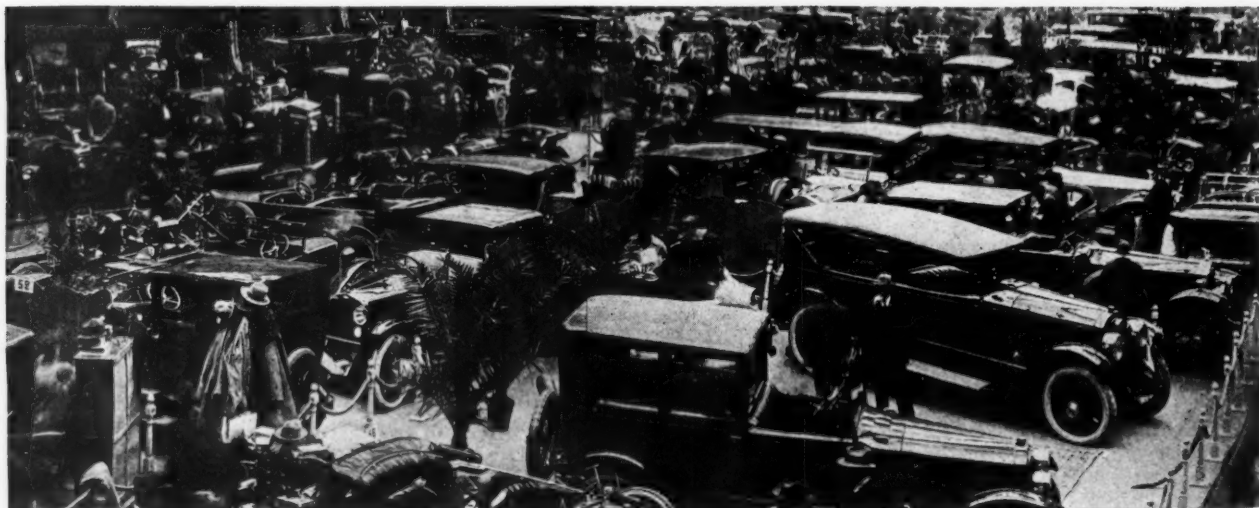
These advertisements, published in the daily papers by the Chicago Enclosed Car Show Committee, not only advertised the show but created an inquiry for enclosed cars in the community stores among people who had not visited the show

MOTOR AGE'S PICTURE PAGES



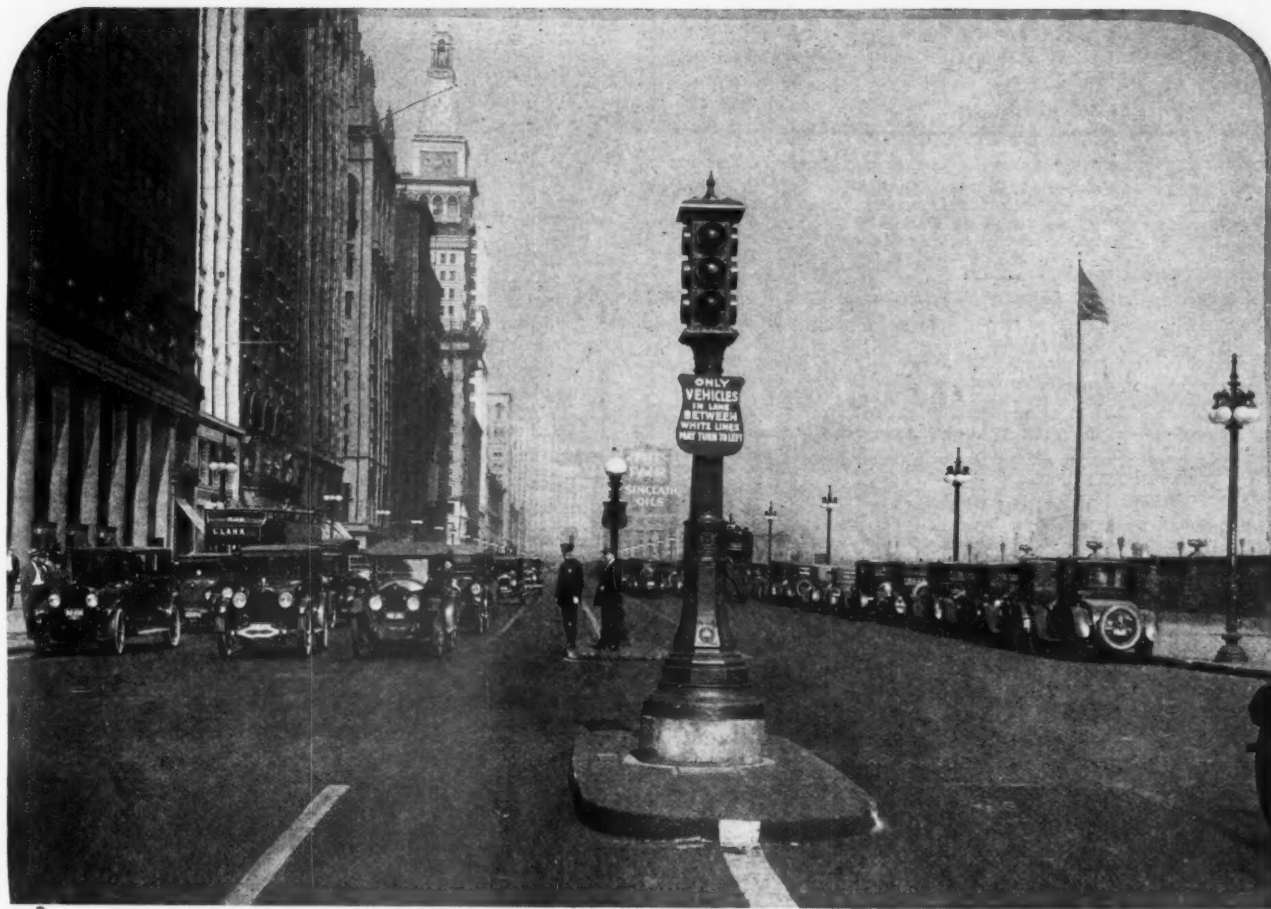
Here is a view of the annual German Automobile Show, which opened in Berlin on September 28. For a nation which is said to be on the verge of financial collapse and general disintegration, Germany seems to be putting up a pretty good front with her cars

"Cannonball" Baker, the well known race driver, left New York on October 8, in an attempt to establish a new transcontinental record. Baker is driving a new Oldsmobile six from which low, second and reverse gears have been removed. The idea is to demonstrate that this car, which is a stock model throughout, can make a transcontinental trip, including the mountain roads of the west, in high gear. So far no difficulties have been encountered



The exhibition hall of the Grand Palais, Paris, at the opening of the recent Automobile Show. A record number of exhibits were shown and many were of American built cars

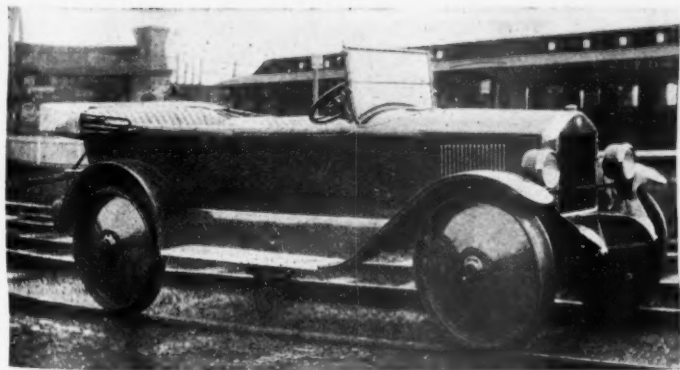
OF AUTOMOTIVE INTEREST



Chicago experiments with automatic traffic signals. One of the new signals, which have been experimentally installed on Michigan Avenue and have already aroused much discussion pro and con, is shown here in action, holding north and south traffic at the corner of Adams Street



St. Louis leaders of the N. A. D. A. following a conference at the farm home of F. W. A. Vesper, former president of the N. A. D. A. Left to right, standing—F. W. A. Vesper, J. D. Perry Lewis, F. C. McDonald, P. E. Drury, E. A. Bilgere, H. C. Merry, Robert E. Lee, G. A. Krause, E. H. Hatfield, C. A. Vane. Sitting—P. H. Brockman, Joseph A. Schlect, Edward Weber, R. C. Frampton



The Australian government has purchased ten Dort cars to be used by division managers and other government railroad officials. These cars are equipped with special axles and flange wheels but are otherwise the same as standard model cars



An F W D buss and trailer which is one of fifteen buss units operated by the Kwongtung Tramway Company, Limited, of Canton, China, in and about that city. Just what all the lettering on these cars means we won't attempt to say, but it certainly makes a picturesque effect

MOTOR AGE

Reg. U. S. Pat. Off.

Vol. XLIV

Thursday, October 25, 1923

No. 17

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The Winter Service Number

THE next MOTOR AGE that comes to you will be the Winter Service Number. This year we are going to talk more directly than ever before about the uselessness and expensiveness of the severe slump in the maintenance business in winter. We have definite figures showing the rate at which maintenance came to 27 dealer shops in the 12 months. The variation in this business is alarming.

Unless this tendency to over capacity work in one month and under capacity work in other months is corrected, it means that automotive maintenance organizations cannot be maintained. The turnover forced by seasonal work will destroy the chance of building a real organization.

In this number of MOTOR AGE we are going to make some direct suggestions as to how this seasonal line of work can be leveled, so that a more uniform organization can be built. We are not going to get the proper personnel in the maintenance industry as long as the men who must be hired view it as a summer job that they must leave to go back to the cement plant, or other factory, in the winter. It is not right to force an automotive mechanic to shovel snow on the streets in winter because the automotive dealers of the country do not give their best thought to leveling the volume of shop work.

And so with this thought in mind, as well as that of

being able to make some money in the months during which you usually have lost money, we are going to ask you to give a special thought to this next MOTOR AGE. And perhaps you know of a friend who especially needs some aids in overcoming the winter slump. If you do, mention to him that MOTOR AGE will supply some helps along this line.

This endeavor on the part of the MOTOR AGE editorial staff is based on the fundamental thought of the organization, "Make better dealers."



The Transportation Store is the key to profits.



Tires

IT was a very interesting item that appeared in MOTOR AGE last week to the effect that the Rubber Association of America had suggested to members of that association that there be a closed season against long term dating of tire bills and that the open season be varied in different sections of the country to best meet the needs of the communities.

In the summer when MOTOR AGE printed articles that were in the form of a protest against this system of merchandising, it appeared from some communications that we received from tire manufacturers that the protest that we were making was without merit. Indeed, at least one letter from a manufacturer defended this method of sales to the point of saying that he thought it was such a splendid system that it should be extended to other lines.

Now comes the association to which this manufacturer belongs and suggests definite restrictions of this method of selling. We believe that the association is in the right and that restrictions of this method of selling will be a splendid move and that a second move to entirely eliminate the practice will be a greater boon to the thousands of transportation merchants and tire dealers who sell tires to the automotive vehicle owners.

If spring dating can be eliminated, there will be an opportunity to stabilize the tire dealer situation to a much greater extent than has been done and MOTOR AGE is very happy to have been of service to the earnest and deserving dealers. We will continue to suggest further changes until the decision is entirely against this practice.



Have you planned that Xmas display yet?



Why of Progress

INNOVATIONS this season in automobile construction, on a production basis, which are more or less radical departures from practices that have become somewhat settled in the last few years, originate from two sources. One is a large corporation producing a line of cars for which there is and has been an ever ready and widening market. The other source is found in a number of smaller manufacturers whose products, although admittedly good, have not been so readily accepted by the public and have seriously felt the need of outstanding improvements in design or construction as selling arguments.

Policy in the first case certainly was not dictated by necessity. Credit must be given, therefore, for the spirit of progress that undoubtedly initiated these innovations and may be depended upon to carry them through to the approach of perfection. Good business judgment and

keen selling sense should have the credit in the second case.

There are, however, some manufacturers of automobiles who, from all appearances, would like to choke progress and give the public next year and the year after the same cars they have been making this year. There might be an argument for it from the standpoint of economy of production but certainly not from the standpoint of economy of operation and maintenance. Even so, it would be a pity were manufacturers to admit that they had reached the ultimate in economy of production.

The field, therefore, is practically wide open for automobile manufacturers in the group known as "small" to apply the results of intelligent progressive research to their products, and while increasing their salability at the same time serve the cause of transportation advancement.



You can sell maintenance every month in the year.



Traffic

THE men most interested in traffic are the men who use the most of it. Probably they are not the ones who make the most noise and perhaps the horns of their fleets as they travel through the community will not make as much noise as the impatient driver of one car, who is driving through the congested section for the first time in months.

The point we want to make, however, is that men give their thought to a problem in direct relation to their interest in it. Talk does not always indicate thought. Often it indicates only temper. And so we suggest that anyone seeking to solve a traffic problem in any community search out the men who use the most traffic, and ask them to help solve the problem.

These men will not try to "hog the streets." They are much too wise for this effort. Their interest lies in safe and free moving traffic. Delays and quarrels are costly to these men, they cost real money, not temper only. And these are the men who will devote time and thought to the solution of the traffic problem.

If the dealers in any community wish to solve the traffic problem their first step should be to bring together in council representatives of the various automotive interests: taxicab owners, fleet owners, street car interests and automobile owner clubs. Of course the dealers should head this movement.

Such a council as this, supported by a united business interest, could work wonders in bringing about a proper traffic interest and they could build a platform on which the police could function more or less effectively. One thing that could be done is to organize a definite program for day parking at a small fee.



Why not adopt an orphan car?



Associations

THE question as to whether an automotive dealer association should make an extraordinary effort to include all dealers in its membership, or establish a standard and admit only such members as conform to this standard has been the subject of much discussion since the N. A. D. A. adopted this program. A good many persons who profess to know a good deal about association work have said that this was not feasible in the average city.

After a year of effort on the plan of select member-

ship, Kalamazoo dealers are taking steps to determine whether or not this is the best form of organization. They know well what an association in that city did before there was a restricted membership and the show was the big item of the year. Everybody joined because they wanted to be in the show. Then they dropped interest until next year. The association, despite the best efforts of a few, did not elevate the public idea of the automotive dealer business.

After a year of restricted membership, a spirit has been developed that promises well if it brings tangible results. Already many minor benefits have developed, but these are chiefly between members. One prominent feature is telling the truth about business practices and employees. This has put a check on prospect lying and false statements of the employee looking for a new job.

Beginning next month, the association will publish some prestige building advertising over the name of the dealers in the associations. All of those in the association hope that this will tend to build confidence with other lines of business. Another year will probably tell whether the efforts of the Kalamazoo dealers are to be considered as something only among themselves or whether it will be a business building effort with the public.

One of the Kalamazoo requirements pertains to adequate service in the dealers establishment. Later, we hope that this requirement shall be extended to the point where it will require that maintenance prices be high enough to justify the shop.



And don't forget the Red Cross Roll Call.



Paying of Bills

THE manufacturers of certain automotive equipment and accessories are having a discussion that is certain to reflect back to the dealers in time. It is a question of what constitutes a payment of a bill that entitles the jobbers to a discount. It appears that many jobbers have been paying bills on or after the 10th of the month and deducting the cash per cent allowed by the manufacturer.

Now comes the manufacturer and asserts that when he says "2 per cent discount for cash in 10 days" that is what he means. He says quite emphatically that he does not mean that if goods are billed out to a jobber Sept. 1, that payment on or before Oct. 10th justifies the jobber to take the cash discount. He says that he meant that if the jobber would pay his bill on Sept. 10, or 11 at the most, that he could deduct the 10 per cent.

Jobbers say that they are passing along to the manufacturer the customs and money of the dealer and that if they pay promptly, they will have to collect promptly.

The manufacturer apparently is not interested in what the dealer does or how strict a line the jobber draws in his collections.

But the dealer is interested in all of this, for it means that if the manufacturer enforces a better collection standard on the jobber, that the jobber will enforce a better collection standard on the dealer.

And if this campaign is successful, the entire trade will benefit, as paid bills are a much better asset than unpaid bills and the dealer who finances his business to a point of prompt payments is much more likely to make money than the dealer who spends much of his time explaining to creditors.

The dealer, of course, has the opportunity to pass the prompt pay idea on to his customer and we hope he will do it.

Big Tire Makers Abandon Retail Lists

Firestone, Fisk, U. S. Give Up Publishing Consumers' Prices

Others Expected to Follow Plan Advocated by Dealers' Association—Prices Again Reduced

NEW YORK, Oct. 22.—Three of the leading tire manufacturers have eliminated the consumer's price list and there are indications that several others are considering similar action. The first to take this radical step was the Firestone Tire & Rubber Co. and its action was almost immediately followed by the United States Tire Co. and the Fisk Rubber Co. The Kelly-Springfield Tire Co. also has discussed the pros and cons of the situation but as yet has not made any decision. Both Goodyear and Goodrich also are noncommittal.

Elimination of the consumer's list is in line with the recommendations of a good many dealers who have contended that a tire merchant should be permitted to mark up his merchandise to yield a margin over operating expenses which he considers necessary, as do dealers in a great many commodities. Particularly in recent months have dealers, notably those in the National Tire Dealers' Association, protested against manufacturers' advertisements of reduced price lists. There was a storm of protest when several manufacturers cut their prices and advertised their reductions last summer while dealers had sizable stocks purchased at dealers' discounts from the old lists.

For some time a number of manufacturers have not had consumer lists but the majority have adhered to the retail list practice.

This action on the part of Firestone, United States and Fisk was not the only stir in the tire world this week. Firestone also announced that it had cut dealers' prices 15 per cent on 4, 4½ and 5 inch sizes, bringing the prices to the same basis set for Ford sizes by its former reduction. Fisk also made a 15 per cent reduction, while United States readjusted its list, reducing certain grades 3½ to 12 per cent and advancing other grades 7½ to 10 per cent, the cuts coming on the larger sizes. On the other hand the Sterling Tire Corp. advanced prices from 5 to 7 per cent.

Northway Company to Be in Amalgamated Motors Merger

NEW YORK, Oct. 20.—Northway Motors Corp., of Natick, Mass., control of which was recently secured by John M. Mack, will be included in the merger of truck interests known as the Amalgamated Motors Corp. of Plainfield, N. J., provided the stockholders approve of the move. It is understood, too, that Mack

himself will be prominently identified with the new corporation, in which are included already the American Motors Corp. and the Bessemer Motor Truck Co.

Proctor W. Hansl, president of the Bessemer American Motors Corp., and who is expected to head the new corporation, states that the initial capitalization of the Amalgamated Motors Corp. is \$1,000,000 of 8 per cent participating preferred stock and 250,000 shares of common. Provision has been made to increase the capitalization to take care of the additional units figuring in the merger, which will represent total assets of \$5,000,000, he says. Additional cash working capital of \$1,000,000 will be provided under the terms of the consolidation plans. The company's financial affairs will be handled by Robert Bursner, treasurer of the Bessemer American Motors Corp., and Irad M. Lewis, formerly president of the Bessemer Motor Truck Co.

Atlanta Fall Show Proves to Be Much Larger Than Usual

ATLANTA, Ga., Oct. 20.—The annual fall automobile show held in connection with the Southeastern Fair here Oct. 6 to 13 proved to be much larger than usual this year, with about 30 of the Atlanta dealers exhibiting, and a number of accessory, tire and equipment exhibits by factories and jobbers in the district.

Although the Atlanta Automobile Dealers' Association took no active part in the show officially, a majority of the automobile dealers that are members of the association had exhibits at the annual fall show, which was held in the Automobile Building at Lakewood Park. The attendance also was considerably greater this year than usual, with visitors present from all sections of the South, and several of the Atlanta distributors who exhibited having special sales meetings with their dealers from this district during the show.

TOLEDO SHOW A SUCCESS

TOLEDO, Oct. 19.—This city's first closed car show got off to a big start with the opening Saturday afternoon and evening crowds and a tremendous gathering on Sunday, which rivalled some of the regular show attendance records. The show was being held at the Terminal Auditorium and closed Oct. 17.

There were 84 different models, representing 26 makes of cars, displayed at the show, which was under the auspices of the Toledo Automotive Trades Association.

ERIE (PA.) DEALERS ELECT

ERIE, Pa., Oct. 20.—The Erie Automobile Dealers' Association has elected John F. Bieher, Buick dealer, as president, and John Roth, Cadillac dealer, as vice-president.

Multitude of Patents Shows Trend of Motor Car Progress

Growing Demand for Innovations and Improvements Reflected by Number of New Devices

WASHINGTON, Oct. 23.—Growing demand for innovations and improvements in automobiles is reflected in the report of the United States Patent Office.

Many of the patents issued up to Oct. 9 have never been marketed and in many instances the inventors are seeking capital to produce their invention. As an illustration of the increasing number of inventions and designs approved by the Patent Office, a list for one day showed patents granted for an automobile theft signal, bumper, means for attaching bumper, curtain holder, drive gear, elevating jack, foot scraper, running board, signal lock, loop-strap-securing device for tops, traffic signal, clamps for adjustment of hood, direction signal, dust shield and collector, lubricating system, removable body, resilient guard.

Patents granted on automobile engines include devices for fuel admission to internal combustion engine; methods and means for starting combustion; pressure feed system for internal combustion engines; starting device for engines. Three patents were authorized on piston rings and one on the piston ring squeezer. Among the tire accessories is a tire inflating device, tire repairing tool, tire tread, three new valves, tire wrapper, air tube for pneumatic tires, blowout boot for pneumatic tires, resilient support for pneumatic tires.

The Patent Office is overworked and there are thousands of applications awaiting attention. It will be recalled that the National Automobile Chamber of Commerce took an active part in a national effort to obtain increased appropriation for this organization last year.

New Jewett Plant to Start Operations on January 1st

DETROIT, Oct. 22.—Production in the new Jewett plant of the Paige-Detroit Motor Car Co. will not start before Jan. 1, at which time the company will be in position to manufacture as high as 500 Jewett's daily in the new plant, and as many as 200 Paiges daily in the former main plant. The present main plant is three-quarters occupied by Jewett production, which is averaging about 185.

Installation of machinery in the Jewett plant is now under way. All of the concrete flooring has been laid and the building is entirely enclosed and has been divided according to departments. With the completion of railroad sidings, everything will be in readiness to receive the main part of the machinery.

Chevrolet Aims at 1,000,000 a Year

October Output Promises to Exceed September Figure

Production Normal for Season and Not Likely to Reach Capacity Until After First of Year

NEW YORK, Oct. 22.—Reports for the first week of October indicate that the number of cars and trucks produced during the month will go beyond the 328,000 figure estimated for September. This follows the curve of production a year ago and reverses conditions in 1921 when October dropped behind September. Output in October of last year was 239,191 as against 206,994 in the preceding month.

Plants are operating on relatively high schedules with no attempt being made, however, to approach the production records of the spring months. The production situation is entirely normal and like that in the sales field is far better than a year ago. No more than the customary slowing up in either sales or plant operations is looked for during the remainder of the year. It is not to be expected that the last quarter will see the same volume of sales that featured the spring or summer months, nor is it within reason to believe that manufacturers as a whole will endeavor to reach capacity operations.

The industry is in a healthy condition both at its production centers and in the retail demand for its output and anticipates steady production and sales until the first of the year when there should come a pronounced picking up.

Truck business is improved, a greater demand being apparent not only for the new but for the used vehicle. General industrial conditions are becoming more stabilized and this is being reflected both in the even demand for cars and in the increasing call for commercial vehicles. Parts makers are moving along on an even keel, with some plants working at top speed. The many new models that have appeared on the market necessitated a temporary slowing-up in some plants which is being rapidly overcome as the new models appear and orders are placed incident to their quantity production.

South Awake to Automotive Christmas Trade, Says Mogge

CHICAGO, Oct. 20.—Arthur Mogge, merchandising director of the A. E. A., was in his office a few days this week between a Southern trip and one in Ohio. For two weeks he had held at least one merchandising meeting a day in and near Louisiana and was greeted by large audiences.

The accessory sales are coming into their own in the south and Mogge found that some of the Louisiana merchants

are making records that are better on certain lines of merchandise than any he has found in the north. Horns are going especially well in the territory he visited.

The dealers in the district visited by Mogge are much awake to the possibilities of the Christmas trade. Last year they tried out some of the ideas they got from the automotive dealer papers and succeeded so well that it was the Christmas film that attracted them to the meetings this year. Where possible, the merchants brought all of their helpers to the meetings.

The New Orleans jobbers made a special effort to line up these meetings and by working in entire harmony, they put the series over and in several cases reported excellent dealer orders the day after the meeting.

15 NEW A. E. A. MEMBERS

CHICAGO, Oct. 22.—Fifteen new members were admitted to the Automotive Equipment Association at the recent Mid-convention meeting of the board of directors. Nine of these were manufacturers and six jobbers. The list follows:

Manufacturers:

Timing Gear Corp., Chicago.
Wells Mfg. Co., Fond du Lac, Wis.
Ernest Holmes Co., Chattanooga, Tenn.
Cuno Engineering Corp., Meriden, Conn.
M. L. Oberdorfer Brass Co., Syracuse, N. Y.
Bimel Spoke & Auto Wheel Co., Portland, Ind.
Nims Pump Co., Stockton, Cal.
American Auto Parts Co., Detroit, Mich.
Halsted Auto Specialties Co., San Francisco, Cal.

Jobbers:

Turner Auto Supply Co., Texarkana, Ark.
Knight & Wall Co., Tampa, Fla.
MacKenzie, White & Dunsmuir, Ltd., Vancouver, B. C.
Heeb Co., Dubuque, Ia.
McLendon Hardware Co., Waco, Tex.
Southern Automobile Supply Co., Washington, D. C.

Resignations of six firms were presented, most of these being due to change or discontinuance of business.

N. A. D. A. MEET DETROIT

DETROIT, Oct. 22.—National Automobile Dealers' Association will hold a district meeting of dealers, salesmen and service managers at the General Motors Building here Oct. 30, the meeting being under the auspices of the Michigan Automotive Trade Association. The full day will be given over to consideration of trade problems, with speakers of national prominence on the program.

CHALMERS FOUR WHEEL BRAKES

DETROIT, Oct. 22.—Chalmers cars are now fitted with four wheel hydraulic brakes, as optional equipment at \$75 extra. The brakes are the external contracting type, operated by the Lockheed hydraulic system.

Factories Organized for Output of 800,000 in 1924

Maximum Production Expected to Be Reached the Following Year —7 Plants Assembling

DETROIT, Oct. 22.—The Chevrolet Motor Co., with the completion of its major building operations, will enter 1924 with the anticipation of marketing approximately 800,000 cars, and is looking forward to reaching the million-a-year class in 1925.

Production at plants of the company will be gradually stepped up as distributing channels are opened, November witnessing an increase from the present 2,200 daily to 2,500 daily. These distribution plans are for the United States market only.

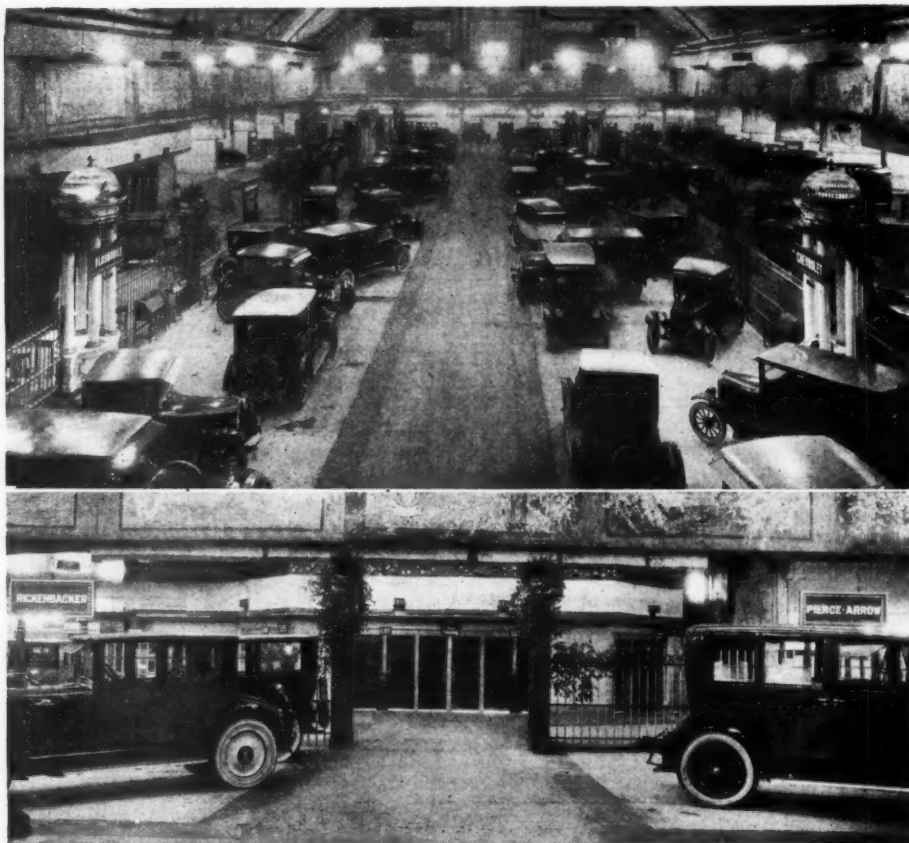
Under the direction of Colin Campbell, general sales manager, Chevrolet now has divided the United States into 23 sales zones, each of which is under the immediate direction of a zone sales manager operating under Campbell. Zone headquarters are at Flint, Tarrytown, St. Louis, Minneapolis, Kansas City, Oakland, Fort Worth, Atlanta, Cincinnati, Denver, Chicago, Buffalo, Pittsburgh, Baltimore, Philadelphia, Charlotte, Memphis, Des Moines, Portland, Los Angeles, Janesville, Louisville, Oklahoma City.

Seven assembly plants are now in operation, each with its own body assembly unit, placing the company in position to meet demand for all models. In addition to the new Buffalo and Cincinnati plants, these are at Flint, Tarrytown, St. Louis, Janesville, and Oakland, Cal. The Flint plant in addition to building the engines for all plants is now assembling 400 cars daily. Tarrytown also is on a 400 daily basis as is St. Louis. The Janesville plant is building 250 cars daily and the Oakland, Buffalo and Cincinnati plants, 200 daily. In each of these the output will be gradually increased, the daily maximum of all plants being close to 4,000.

Each of these plants, though designed to supply specific territories, will serve to supply all territories as demand may fluctuate. The company has definite arrangements with its dealers in all territories on freight rates which are based upon transportation from the plant which normally serves them. Where it is necessary to divert output into other territories to meet special requirements the company has absorbed the differences. With its several new plants freight rates will be greatly reduced in many of the territories, making lower delivery prices on its products.

Manufacturing plants in addition to the Flint plant are the gear and axle group in Detroit.

Where Chicago Saw Closed Cars



Many Sales Made at Chicago's First Enclosed Car Show

CHICAGO, Oct. 20.—Chicago automobile dealers are so well pleased with the results of their first closed car show under one roof which closed tonight that the Trade Association has contracted for the Coliseum for another show about this time next year. Many sales were made on the floor and valuable lists of prospective buyers were obtained by all of the 43 exhibitors.

This is the first time Chicago has had an opportunity to view the season's latest models of closed cars all on one floor and the people as a whole took kindly to it. Last year the Trade Association sponsored a closed car week during which complete displays were made in the dealers' especially decorated sales-

room and although the association spent \$15,000 for advertising the affair was not considered as successful as the show which has just closed.

Admission of 75 cents and war tax was charged and there was a strict limitation on free tickets. The weather was bad. The result was that although the floor was not crowded, those who came were in most cases genuine prospects for new enclosed cars. Display advertising carried in the newspapers throughout the week materially swelled the attendance.

The record of sales made on the floor has not been tabulated. Four exhibitors representing a wide range of prices reported 20 sales with prospect lists that will keep their salesmen going for several weeks. Practically all exhibitors reported sales which more than repaid them for entering the show.

CHECKS VS. CASH

ST. LOUIS, Oct. 22.—Bad check passers have been working on the automobile industry quite heavily of late. Headquarters of the N. A. D. A. have had reports from at least a dozen dealers in Alabama, West Virginia, Ohio, Missouri, Iowa and other places of bad checks having been passed upon them for amounts ranging from \$16.35 to the price of a Studebaker light six touring car. More reports were received in one week than during the past two years.

These cases have been placed in the hands of a detective agency.

NEW OVERLAND PLANT

PHILADELPHIA, Oct. 23.—The Willys-Overland Atlantic Co. has been organized to have charge of the new assembly plant recently acquired at South Forty-ninth street, Botanic avenue and the Schuylkill river. George D. McCutcheon is president and general manager of the new company. Eastern agents of the company have finished an inspection of the plant.

The plant is scheduled to begin operations with the new year and will have a capacity of 200 cars a day. It will be the assembling base for Eastern districts.

Program for District Meets of N. A. D. A. Is Completed

Detroit, St. Louis and Columbus, O., to Hear Same Talks on Varied Subjects

ST. LOUIS, Oct. 22.—The program for the district meetings of the National Automobile Dealers' Association to be held in Detroit on Oct. 30, St. Louis, Dec. 10, and Columbus, O., Dec. 5, has been completed. The program is the same for the three meetings.

It follows:

9:45 a. m.—Call to order.

10:00 a. m.—Announcements.

10:15 a. m.—Automobile Dealer Profits, What They Are, Where They Go and Why. C. A. Vane, general manager, N. A. D. A.

11 a. m.—What Constitutes an Automobile Dealer, C. E. Gambill, Chicago, vice president, N. A. D. A.

12 noon—Luncheon.

1:30 p. m.—Salesmen Who Know, Get the Money, J. S. Knox, Cleveland.

3:00 p. m.—The Greatest Asset in Business, Percy Chamberlain, N. A. D. A. Speakers' Bureau.

4:00 p. m.—Obligations of a Dealer, Fred W. A. Vesper, treasurer, N. A. D. A.

Estimates Passenger Car Sales at \$3,375,000,000 This Year

NEW YORK, Oct. 22.—Addressing the Bankers' Forum, New York Chapter, American Institute of Banking, B. E. Hutchinson, vice-president and treasurer of the Maxwell Motors Corp., estimated that the retail value of passenger car sales in the automobile industry this year at approximately \$3,375,000,000, or about \$144 per family. Automobile manufacturers and dealers, he said, have about \$2,000,000,000 capital invested, and estimating the national wealth at three hundred billion dollars, about 1.3 per cent of it is tied up in automobiles in use.

SERVICE MEETING CHANGED

NEW YORK, Oct. 22.—The factory service managers' meeting scheduled by the National Automobile Chamber of Commerce for Nov. 13 and 14 at Dayton, O., has been made a joint affair through the Society of Automotive Engineers joining forces with the Chamber, and the dates have been advanced a week, to Nov. 20 and 21, largely because of the conflict with the Automotive Equipment Association, which will hold its meeting Nov. 12-17.

ELECTRIC VEHICLES SHOWN

NEW YORK, Oct. 22.—Fifteen exhibitors of storage battery vehicles and their parts took part in electric truck day at the sixteenth annual electrical and industrial exposition at the Grand Central Palace last week. The day was featured by demonstrations of the economy and reliability of electric trucks for city and suburban delivery purposes.

More Than 600 Community Dealers Supply Chicago's Great Demand for Automobiles

The Michigan Avenue "Row," Once the Principal Retail Center and Still Resplendent With Display Rooms, Takes on Character of Wholesale Distribution Source

CHICAGO, Oct. 23—The shifting of a large volume of the retailing of automobiles in Chicago from Automobile Row, that stretch of a dozen blocks in South Michigan avenue, to many community centers, a movement which has been in progress for a number of years, has become so pronounced that some of the larger distributors now look on the "Row" as primarily a wholesale district.

Display rooms, of course, are maintained on the Row and service stations are nearby, so that the district has by no means diminished in importance as an automobile center. Its character has simply changed with the years from the retailing center supplying a few buyers to the distributing center from which the vastly increased car-owning public of Chicago is supplied.

This change has been effected principally through the impetus given to the community-dealer idea the last two or three years, and the establishment of distributor branches. Some of the pioneers in the industry, such as Thomas J. Hay, Louis Geyler, Studebaker, Buick, Westcott, Overland, and others, recognized as long as 12 or 13 years ago the advantage to be gained by numerous points of sales contact, and others in the business of selling automobiles have later found the plan profitable. The result has been that there are now in Chicago and suburbs, working directly under local distributors or a factory branch here, more than 600 community dealers, the number having been 595 as of Sept. 1, with distributors adding to the ranks right along.

"Open" Territory

In practically every case the dealers in Chicago and Cook County operate in what is known as "open" territory. In other words, they are allowed to sell a car to anyone in this territory, even though the prospect may not reside in the immediate vicinity of the dealer's place of business. The old card system of listing prospects and reporting them to the distributor has almost entirely been eliminated, so that now the prospective car owner is "anybody's property."

One notable exception to this is the Hudson distributor. In this instance a card system of listing prospects is maintained in the office of the distributor. Dealers are required to report on prospects every 20 days. In default of this the dealer in whose territory the prospective purchaser is located forfeits the exclusive right to sell him. The Hudson people have dealers and branches located throughout the city and suburbs equipped

to service the cars of Hudson owners, and the idea of operating under the closed-territory plan is to encourage owners to have their cars serviced in the community in which they were bought, and to prevent dealers from bidding against each other on cars taken in trade.

Under the plan as it now exists, the appraisal of a used car is subject to the approval of the used car department, and so the result is that if a buyer is offered, say, \$900 for his old car by one Hudson dealer, and being dissatisfied with that figure, goes to another Hudson dealer, he receives exactly the same offer.

Among those who have not adopted the community-dealer idea are Franklin, which, however, have branches located in different parts of the city; Anderson, Lafayette, Locomobile, McFarlan, Pierce-Arrow, Kissel and Noma. Others, such as Cole, have tried it and found it unsatisfactory. Others are decidedly opposed to it on the ground that the community dealers are not, in most instances, properly equipped to give the proper kind of service on the cars which they sell, and that there is too great a temptation for dealers to make extravagant allowances on used cars, which ultimately results in financial ruin, it is claimed.

One Chicago distributor maintains an office downtown with dealers throughout the city, thus materially reducing the heavy overhead usually connected with a large distributor establishment. He maintains a warehouse and when the sale is consummated the purchaser gets a warehouse receipt for an automobile.

It is the aim of the local distributors and branches to have their community dealer handle only the car or cars represented by the distributor, and in the main this is the case. One large company handling one of the low-priced cars incorporates in the contract with its dealers a provision making it mandatory that they handle only the one line. In other cases the percentage handling alien lines is small.

In connection with the growth of the idea of community dealers it is significant to note that the Dodge car, which heretofore has been distributed in Chicago only through the Dashiell company's Michigan avenue store, is now being handled also through two branches of that company, one on the north and the other on the west side, where service also is provided.

Distributors who have tried the plan report substantial increases in sales as compared with the old method and believe that it is a good thing when practiced with due regard to the maintenance and used car problem.

Thefts Could Be Checked by Title Registration Laws

Head of U. S. Secret Service Tells A. A. A. That States Can Stop Thieves

WASHINGTON, Oct. 20.—Officials of the American Automobile Association, seeking a way to cut down the constantly growing number of automobile thefts, are assured by William J. Burns, head of the Bureau of Investigation of the United States Department of Justice, that these thefts can be effectively checked by the passage of title registration laws by the various states. This, he thinks, has been demonstrated by the successful experience of the states which have enacted adequate title registration and title certificate laws.

Results which have been obtained by the Bureau of Investigation under the direction of Burns during the four years of its operation indicate the value of the Dyer or national automobile theft act which makes interstate or international traffic in stolen cars a Federal offense. The annual report of the Department of Justice as to the work done by Burns' bureau is expected to show that during the four years many millions of dollars worth of stolen automobiles have been returned to their owners with thousands of convictions accompanied by prison sentences.

In such states as Maryland and Michigan, where thorough title registration laws are in effect, Burns points out that it is almost impossible to sell a car stolen within the border of that state as the thief or fence is unable to furnish a clear certificate of title.

"This does not prevent cars from being stolen in these states, however, as they are run into other states to be sold," says Burns. "But if all states had similar laws, nine-tenths of the inducement to theft would be removed and I see no reason why nine-tenths of the thefts would not cease."

TO APPRAISE VIM PROPERTY

PHILADELPHIA, Oct. 20—M. J. MacNamara and John P. Hill have been appointed appraisers, with William P. Rowland, to appraise the property of the Vim Motor Truck Co., and report to the United States Court for the Eastern District.

The petition of the Littlehale Advertising Agency, Inc., New York, against the Vim Motor Truck Co., for the appointment of a receiver, has been dismissed by the court for lack of jurisdiction, the amount involved in that particular case being less than \$3,000, and the claim not having been reduced to a judgment. The amount claimed by the agency was \$252.55, for services between January and June of the present year. As already announced, receivers have been appointed for the truck company on another petition.

Boston Dealers Promote New England Used Car Campaign

L. B. Sanders, Organizer of Statistical Bureau, Heads Movement to Improve Merchandising

BOSTON, Oct. 20.—Directors of the Boston Automobile Dealers Association have authorized the inauguration of an educational campaign among New England dealers to improve merchandising conditions and particularly to better the used car situation.

L. B. Sanders, who organized the Boston Used Car Statistical Bureau, a division of the dealers' association, and who made addresses on the Boston plan in cities all over the country, will be in charge of the work, together with J. W. Bowman, general manager of the Statistical Bureau.

It is planned at the start to confine the campaign to New England, but it may be made available later for other sections of the country.

Motion pictures, lectures and round table conferences of dealers will be used to emphasize the causes of profits and losses in used car trading and to encourage methods which will make competition cleaner and profits more satisfactory.

It is planned to divide the New England territory into zones with a distributor or dealer in each zone acting with the managers of the campaign in an advisory capacity. The various zone representatives will make up a general committee which will direct the campaign. It has not yet been decided whether financial support will be sought from dealer associations throughout the territory or will be asked of individual

dealers benefiting by the campaign.

It is planned to hold zone meetings 60 or 90 days apart and to provide educational features for salesmen, service men and other branches of a dealer business.

The ground has been fairly well prepared in New England for this campaign by the wide distribution of the Boston Black Book, containing average resale prices of various makes and models of used cars, corrected whenever values change. This book, published by the Boston bureau for its members, is subscribed to by several hundred dealers in New England and in a good many other sections of the country.

DODGE CANADIAN MOVES

DETROIT, Oct. 20.—Dodge Bros. has removed its Canadian headquarters from the terminal of the Canadian Pacific Railroad to the plant in Windsor formerly occupied by the Walker Twist Drill & Tool Co. The new quarters are leased and will give the company greater facilities for the handling of its Canadian business. Aside from the fact that the new building will give the company more space for its increasing Canadian business, the removal to the new plant does not mean any change in the Dodge method of building for the Canadian market.

For the past several years Dodge has built cars completely in its Detroit factories, which it then shipped under their own power to Windsor, where many American parts were removed and Canadian parts and equipment substituted. By using as many Canadian built parts as possible, the import tax was greatly reduced. The Dodge company has no manufacturing plants in Canada, the parts changed being mainly equipment items, such as tires, wheels, etc.

Dealer Wins Suit Based on Sale of 1921 Car as a 1922

Ford Engine Was Made Late in Year and Car Was Sold in Spring as That Year's Model

HARTFORD, Conn., Oct. 22.—Of more than usual interest is the decision of Judge Edwin C. Dickenson in the court of common pleas in the case of Paul Moran of East Hartford who sued the Bennett Hartford Co. for \$100, alleging misrepresentation. Moran claimed that the company had committed a fraud by inducing him to buy a Ford represented as a 1922 model when it was a 1921 model.

Judge Dickenson said the testimony was conflicting as to what determines the year of a Ford, but the weight of evidence indicated that the engine number is the deciding factor. "It appears," the court said, "that the car was the latest model and that the engine was manufactured in November, 1921. There is no evidence to show that the car delivered to the plaintiff was a particular car selected by him. The order was given in January and filed by delivery in April of 1922. The testimony of the defendant and his witness satisfied me that whatever the fact, he considered the car to be a 1922 car, and had no intent to deceive the plaintiff as to the year of its manufacture. That the court has accepted the opinion of the plaintiff's experts does not impute fraud in the defendant. Cars of this model and design, it appears, were considered by him as 1922 cars. Incidentally it seems that the motor was identical with those bearing the 1922 serial numbers."

The court found no fraud and rendered judgment for the Bennett Hartford Co. to cover costs.

Officials of D. A. D. A. Service Managers' Group



The Service Managers' Association of the Detroit Automobile Dealers' Association recently re-elected George W. Stroh as president and J. F. Collier as vice president. Those in the photograph, from left to right, are: H. W. Watkins, Paige Sales & Service Co., director; J. E. Mills, Packard Motor Car Co., director; J. F. Collier, Reo Michigan Sales, vice-president; George W. Stroh, Simons Motor Sales Co., president; H. W. Baker, Buick Motor Co., director.

Advertising "Stop" Signs Under Fire of A. A. A.

WASHINGTON, Oct. 20.—The American Automobile Association, in co-operation with State highway departments, is campaigning for the removal of unnecessary signs and "stop" signals used for advertising purposes along public highways, classifying them as dangerous and a menace to the driving public.

In Connecticut the State Highway Department has requested the Motor Vehicle Department to have removed "stop" signs placed by property owners in advance of private roads leading from the homes to the main highways, maintaining that it is the duty of these owners to stop before driving onto the main highway.

The danger of the use of warning signs or stop signals on the highways where they are not required makes the motorist who has been fooled by unnecessary signs careless when he approaches a warning signal which is properly placed for his protection, the A. A. A. declares.

N. A. C. C. Declares Rural Sections Afford Great Undeveloped Motor Vehicle Market

Shows by Analysis of 1922 Registration That Number of Cars Per Thousand of Population is Greater in Cities of From 1,000 to 5,000, but Farmers Need Them Most

NEW YORK, Oct. 22.—Research on the part of the National Automobile Chamber of Commerce, followed by deductions based on the registration figures of 1922, discloses that the saturation point is distant so far as the farmer is concerned and that the sales possibilities of the rural districts are something well worthy the consideration of automobile makers and sellers.

This research has resulted in General Manager Alfred Reeves advising members of the wonderful opportunity they have among the farmers. Reeves finds that the farm market for automobiles is still undeveloped compared with the rest of the country. Although the farmer owns 30 per cent of all the motor cars, yet this is not his proportionate share of the business on the basis of population, Reeves finds. There are only 70 cars per 1,000 persons in the rural districts as compared with 127 automobiles per 1,000 in towns and cities of 1,000 population and upwards, he declares.

Analyzing the research, the N. A. C. C. general manager continues:

"The ownership of motor cars is proportionately heaviest in the villages of 1,000 to 5,000, which have but 9 per cent of the population of the United States and yet own 20 per cent of the total automobiles. Stating it another way, these communities have one motor car for every 4.4 persons, or 230 cars per 1,000 persons.

"It may be that the rural use of the car is more intensive than would appear from these figures, because it is probable that thousands of cars actually owned on farms are registered as from the nearest small town. This, too, would account for the extra heavy registration in the village group. The modifying factors, however, can hardly be sufficient to shake the conclusion that the farm market in relation to population is still the least developed, since the registration per capita in the country and in the city is so large.

"From these figures, it would appear theoretically that the farming territory offers the best future market and in the long run this is probably the case. No occupation gets more value out of the motor car than does farming, and the figures indicate that a large percentage of this market remains unsupplied.

"There are other points to be taken into consideration than population, however, such as income and roads. As much of the farmer's income is in elements

other than cash, it is difficult to make a comparative study of this basis. The rural highway situation is rapidly improving, as is evidenced by the fact that federal, state and local road construction is going ahead at the rate of more than 20,000 miles per year.

"It may be that the small town will continue to be the easiest selling field, since wealth begets wealth. That is, those who invest in power machinery and other modern appliances, such as motor transportation, conserve their energy and raise their efficiency so that they can afford to buy more. Furthermore, the towns and cities, now heavy owners of motor cars, afford a basic replacement market.

"From a long range standpoint, however, there is a vast field for motor transportation in the millions of farmers who are not supplied with this modern convenience. The distances are great, giving consequent importance to the saving of time. The farmer must have a vehicle to get back and forth from town. The uses of the car are manifold in rural regions, and the country owner has little expense or worry about parking and garaging.

"With the exception of rural use, the density of motor cars to population decreases as the towns increase in size. For instance, cities between 5,000 and 25,000 have 150 motor cars per thousand as compared with 230 in the 1,000 to 5,000 class. The cities ranging from 25,000 to 100,000 have 119.6 cars per thousand persons and the larger cities, those over 100,000, have 84 cars per thousand. These general averages do not apply to all sections. In the corn belt and wheat states, also in California, one finds a very high percentage of motor cars on farms, as for instance, in Iowa and Nebraska, where there are more than 150 motor cars for every thousand persons.

"In the Middle Atlantic states, where there are many of the largest cities having a high percentage of office and industrial workers who live within the crowded city limits, the ratio of cars in municipalities is low. Conversely, the farm ownership of cars in this territory is fairly high, due to the productivity of the farming land, the degree to which highways have been improved, and the extent to which the city markets call for local transportation, market gardening and dairy products."

Dealers Losses on Used Cars Drop to \$5,654,000 Sept. 30

N. A. D. A. Shows Reduction of 73½ Per Cent From Period Ending July 31

ST LOUIS, Oct. 22.—Dealers' losses on used cars during the three months ending Sept. 30, dropped to \$5,654,000 on 399,000 cars, according to figures compiled from reports of dealers to the National Automobile Dealers' Association. This reduction is 73½ per cent from the previous three months, ending on July 1 when losses reported amounted to \$21,000,000 on 360,000 cars, and a further saving on the first three months of the year when the losses amounted to \$23,000,000 on 400,000 cars.

From the figures it is apparent that the used car demand is for about 300,000 cars a month and on Oct. 1 there were 399,600 used cars in dealers' hands with an approximate value of \$134,830,800, or \$377.41 per car. From figures for the balance of the year this should be only a little more than one month's supply, but it is anticipated that these stocks will be increased during the next three months when the market for this grade of car is not so active and when the increase in cars taken in trade will add to the stock on hand.

Since Jan. 1, dealers have handled 2,700,800 used cars at a loss of approximately \$49,000,000 up to Oct. 1, which compares favorably with the figures of last year when the loss was \$105,000,000 for the 12 months. These losses represent only the difference between the prices allowed for cars and the amount for which they were sold and do not take into consideration reconditioning and overhead.

Undoubtedly the increase in the use of "used car plans" and general education in the handling of this problem have contributed to the reduction in losses. But from reports, there are still numbers of dealers who strive mainly to escape losses and never hope to show a net profit on their used cars. However, there are dealers who EARN money on their used cars, not much, it is true, but yet it is a gain and not a loss, say officials of the association.

The used car plan of the National Association will soon be ready to be placed before the trade throughout the country and into this plan have gone the ideas and methods evolved from the surveys of the situation which the association has carried on.

W. H. YELDELL COMPLETES TOUR

ST. LOUIS, Oct. 20.—W. H. Yell dell, sales and advertising manager of the Gardner Motor Co., Inc., has returned from an extensive western trip which required about five weeks. He visited Gardner dealers and distributors and found business good in nearly all places.

41,227 FORDS IN WEEK

DETROIT, Oct. 20.—Ford production totals for the week ending Oct. 16 were:

Cars and trucks for domestic sale, 41,227; tractors, 1,841; Lincoln, 215, a new high mark.

Work Started on Immense Ford Factories at St. Paul

Main Plant Will Have 23 Acres of Floor Space—Will Use River Transportation

DETROIT, Oct. 20.—With ground broken for the assembly and manufacturing plants of Ford Motor Co. at St. Paul, some details of the general construction are released by the company. The plant proper will be one story in height, 1,720 feet long by 600 feet wide, inclosing more than 1,000,000 square feet or 23 acres of floor space. The building will be faced with stone on three sides to conform with the general beauty of the surroundings.

The manufacturing plant, 100 feet above the level of the river, will connect with river loading platforms by means of tunnels running back underneath the factory to elevators which will carry freight directly into the buildings. This is in anticipation of a new era of river transportation on the upper Mississippi.

In addition to the water shipping facilities, the Chicago, Milwaukee & St. Paul railroad is building a branch line direct to the plant.

The power house of the hydro-electric development will be 160 feet long, 74 feet wide and 48 feet high above the foundations. In exterior treatment it will conform to the same design of other Ford projects. Four water wheels of 4,500 horse power each will be installed in concrete scroll cases with concrete draft tubes. A steam power house will also be built as an auxiliary.

Utica Motor Car Co. Wins in Cadillac Steeplechase

UTICA, N. Y., Oct. 20.—The Utica Motor Car Co. and Gordon L. Potter, one of its salesmen, were winners in the Cadillac National Steeplechase, a sales contest which has just closed after five months' duration.

The company, headed by Francis P. Miller, president, and Edward J. Otis, treasurer, won the \$1,000 prize and a silver cup offered by the Cadillac Motor Car Co. the distributor organization selling more than 300 cars a year and making the highest percentage of its quota during the five months of the contest. Potter won the 1924 Cadillac phaeton offered by H. H. Rice, president of the Cadillac Motor Car Co., for the best individual salesman's record.

In addition to the Cadillac car which Potter has just brought home from the factory, he won three gold watches and \$233.63 in cash. Other salesmen of the Utica Motor Car Co. who won prizes were L. T. Ledwell, a watch and \$96.93; O. S. Bishop, \$27.28; and J. G. Glenn, \$20.67.

There were more than 400 distributor and dealer organizations and 1,280 salesmen throughout the country entered in

the steeplechase, in which the leading contestants ran so closely that it took three weeks to compile results after the competition closed.

Lee's System of Reporting Unpaid-for Cars Is Popular

ST. LOUIS, Oct. 20.—Robert E. Lee, secretary of the St. Louis Automobile Dealers Association, has devised many ways and means of serving the interests of dealers in this city, but few if any of his services are appreciated as highly as the practice of reporting to all dealers cars repossessed for failure to pay.

Under Lee's system when a dealer is forced to recover a car because of the failure of a time payment customer to pay he reports the matter to Lee's office with details of the make of the car, and the name of the buyer. This information is then furnished to all dealers and prevents anyone who might have the inclination from going to another dealer, making one payment on a new car and having the use of it for some months.

VANE TALKS AT BALTIMORE

BALTIMORE, Md., Oct. 23.—The automobile dealers of this city tendered a rousing reception to C. A. Vane, secretary and general manager of the National Automobile Dealers' Association, when he visited Baltimore on Oct. 9 and spoke before the Baltimore Automobile Trade Association, Inc. Vane delivered his lecture on "Automobile Dealers' Profits—What They Are, Where They Go and Why."

FIRST FRANKLIN SEDAN

SYRACUSE, N. Y., Oct. 22.—Ten years ago on next Oct 29 Franklin Automobile Co. completed its first Franklin sedan, which the company claims was the first stock sedan made in America. The Franklin company states that this car is still being operated by its present owner, S. A. Leake of Dallas, Tex., who bought it June 3, 1922, from G. A. Robertson of Dallas, the original purchaser.

DURANT'S BANK OPENS

NEW YORK, Oct. 19.—The formal opening of the Liberty Bank in New York, founded by W. C. Durant, took place Wednesday. It is located at 250 West Fifty-seventh street in the Fisk building. The president of the bank is Carroll F. Downes, who also is president of Star Motors and who formerly was a Philadelphia banker before joining the Durant interests.

FORD AND THE PRESIDENCY

WASHINGTON, Oct. 20.—Political observers here believe that Henry Ford has definitely established himself as a candidate for the Presidency in his decision to return his war profits to the Government and his challenging the administration on the Muscle Shoals issue. It is stated that both moves will undoubtedly have an influence upon the farmer vote.

Increase in High Priced Car Sales; Decrease in Low Priced

Metropolitan District During September Shows Drop in Medium Sales Also

NEW YORK, Oct. 20.—Statistics compiled by Sherlock & Arnold, publisher of the Automobile Sales Analysis, show an increase in sales of higher priced cars in the Metropolitan district during September and a drop in the medium and low priced.

In the former class, two cars maintain the lead with sales for the nine months in excess of 1,000, while five others show sales greater than 200. Four cars in the low and medium priced class show sales of more than 5,000 for the three-quarters, with two others in excess of 2,500 and nine others greater than 1,000.

Total sales of higher priced cars for the nine months of this year are 6,010 as against 5,581 in 1922 and 3,564 in 1921.

Aggregate sales for the same period this year in low and medium priced models are 67,150 as compared with 54,023 in 1922 and 35,802 in 1921.

Recapitulation of sales for the nine months of this year is as follows:

Month	Low Priced	Medium and Higher Priced
January	2,814	201
February	2,801	580
March	8,102	769
April	11,124	1,106
May	11,287	992
June	9,782	732
July	9,234	653
August	6,531	469
September	5,475	508
Total	67,150	6,010

Portland Dealers Elect Officers—Will Hold Show

PORTLAND, Ore., Oct. 20.—At the annual business meeting of the Automobile Dealers Association of Portland, George A. Braley was elected president and A. B. Manley vice president. They replace A. S. Robinson and C. L. Boss, who have served during the past year.

Braley is senior member of the firm of Braley & Graham, Dodge Brothers distributors, and Manley is head of the Manley Auto Co., Hupmobile distributor.

Additional directors elected were J. C. Crittenden of the Covey Motor Car Co., Maxwell, Chalmers and Cadillac; L. R. Fields, Fields Motor Car Co., Chevrolet; W. E. Kearns, Portland manager for the Howard Auto Co., Buick; H. W. Roberts, Roberts Motor Car Co., Federal truck; C. E. Francis, Francis Motor Car Co., Ford; J. H. Alfred, Portland manager for the Willys-Overland Pacific Co.; and John K. Leander, John K. Leander Co., Studebaker.

At the session it was decided to hold the annual Portland show again as usual this winter and the new officers and directors will at once turn their attention to the matter. The show will probably be held the first week in February, although the date is not yet set.

New Torque Converter Stirs Foreign Engineers' Interest

Henry L. Horning Returns From Trip to England with Details of "New Wonder Gear"

NEW YORK, Oct. 20.—Henry L. Horning, general manager of the Waukesha Motor Co., just back from a hurried trip to England, brings with him details of the new torque converter invented by George Constantinesco which has created much interest in Europe because of its radical departure from the conventional and which is declared by some engineers on the other side to have the ear marks of being a "revolutionary innovation," a "new wonder gear."

As Horning describes it, it abolishes the gearbox and clutch and provides an almost infinite variable gear which automatically adjusts itself to the load and gradient. As *English Motor* describes it, "the torque of the engine is stored or piled up, so that even scotches under the wheels will be surmounted in 'tank' fashion; it eliminates friction, noise and reversal of drive in the transmission, besides greatly reducing weight and enabling a much smaller power unit for a given load and speed to be used."

Constantinesco, Horning points out, is not unknown to fame, for during the war he brought out the device which made it possible to fire machine guns mounted on an airplane so that the bullets passed between the propeller blades at any rotation.

Gearset development, Horning discovered, is one of the dominant subjects that is receiving engineering attention and creating a great amount of speculation in England at the present time. The engineering development is along lines of making gearshifting easier—in fact making it automatic. The epicyclic gear with four forward speeds is undergoing development and experimental cars are being tested out which show unusual advantages for this type of gearset. The feeling has gained much headway with British engineers that the conventional gearbox is not by any means the best unit for the work, and the engineers over there are attacking fundamentals in the consideration of this subject.

GASOLINE STOCKS REDUCED

WASHINGTON, Oct. 22.—A survey just completed by Bureau of Mines, Department of the Interior, indicated a diminution of the nation's gasoline stocks on Sept. 1 to a figure of 1,053,856,221 gallons, representing 47 days supply, as compared with a stock of 1,165,389,340 gallons, or 54 days supply, on hand Aug. 1. Gasoline stocks on Sept. 1 of last year amounted to 703,738,310 gallons, or 37 days supply.

Gasoline production in August amounted to 648,954,706 gallons as compared with 637,000,000 gallons in July and 550,000,000 gallons in August, 1922. Domestic consumption during August amounted to 692,185,610 gallons, an in-

crease of 18,000,000 gallons over the July consumption and an increase of nearly 109,000,000 gallons over August of last year. Exports of gasoline in August were 78,503,475 gallons, a decrease of 5,000,000 gallons from the July figures, but an increase of 50,000,000 gallons over August of last year.

No "Czar" to Ascend Throne of Tire Industry as Suggested

NEW YORK, Oct. 20.—Rumors to the effect that the tire industry was seeking a leader comparable with Judge Landis of the baseball world or Will Hays of the movies are discredited in this city. Such a director was suggested some time ago, but no action ever was taken and the idea was abandoned.

"When Horace De Lissier was elected to the presidency of the Rubber Association of America he, in a talk with his directors, advised that some thought should be given to the idea of selecting some prominent man to take hold of affairs and crack some of the problems confronting tire makers," said one close to the Rubber Association, in discussing the report that came from the Midwest Rubber Association meeting in Chicago last week. "The matter never came up for further discussion, however, for Mr. De Lissier died soon after and nothing was done on the suggestion. I think nothing will be done, either."

CHANGES NAME

ST. LOUIS, Oct. 20.—At a recent meeting of the Motor Accessory Trade Association of St. Louis, a motion was carried to change the name of the organization to the Automotive Accessory Association of St. Louis.

Dan F. Hyland, president of the association, appointed a committee composed of Henry Kruse, H. H. Fleer and J. A. Meyerpeter to consider the establishment of a credit bureau.

A movement was launched at the meeting to provide a new tourists' camp for St. Louis next year.

ORGANIZES TRUCK COMPANY

SAN ANTONIO, Tex., Oct. 22.—The Texas Manufacturing and Engineering Co. of San Jose, Tex., has been incorporated. The capital stock is \$400,000. Among the incorporators are E. G. Snowden, W. M. Foster and Allen Buell, Jr., all prominent business men of Southwest Texas.

In announcing the corporation men identified with the company declared it the purpose of the concern to manufacture automobile trucks and tractors.

44 AUBURN DEALERS MEET

PHILADELPHIA, Oct. 20.—Forty-four dealers in Auburn cars attended a meeting held by the Pierpoint Motor Co. at the rooms of the Philadelphia Automobile Trade Association. C. C. Clark, Auburn factory district representative, J. R. Pierpoint, W. H. Brearley, Harry Grant and J. R. Fritz made brief addresses.

Painters of Dallas Launch Campaign to Sell Finishing

Point Out Advantages of Having Skilled Men Do Painting and Trimming

DALLAS, Tex., Oct. 22.—The Master Auto Painters and Trimmers Association of Dallas has launched an advertising campaign designed to point out to the public the necessity of having their cars painted or trimmed by master mechanics and in a manner which will obtain satisfactory results. The association is laying stress upon the fact that approved methods, the ways and means of obtaining work which will last, require 23 distinct operations involving a period of 21 days for a first class job of painting and trimming or 11 distinct operations extended over a period of 10 days for a second class job.

The association, through paid advertisements in daily newspapers, is telling the automobile owners that nothing short of this class of work will produce a finished job of painting which will stand the test and prove economical in the long run.

The association in its campaign of education has the endorsement of the Better Business League of Dallas and the O. K. of jobbers and dealers in Dallas. It is announced many of the manufacturers are directly interested in the outcome of the educational campaign launched by the master painters and trimmers of Dallas.

In Dallas recently there have been established a number of paint shops which advertise to "paint your car over night." These shops are accepting a car in the afternoon and turning it out "painted" the following morning, or taking a car in the morning and delivering it "painted and trimmed" the following day. The prices charged range from \$12.50 to \$25 according to the size and make of the car.

While the advertising matter of the local association does not refer to these "over night paint shops" there is no attempt to conceal the fact that the association is attempting to warn car owners they can not reasonably expect a first class job of painting in such short time.

NEW CHICAGO-ST. LOUIS ROAD

BLOOMINGTON, Ill., Oct. 19.—The Illini boulevard, a 300-mile concrete highway connecting Chicago and St. Louis by way of Joliet, Bloomington, Springfield and Edwardsville, was opened last week. The road is 18 feet wide. It was built at a cost of approximately \$9,000,000. Although Chicago and St. Louis already were connected by a paved road by way of Danville, this new route is proving very popular because it is nearly 50 miles shorter. It is now nothing unusual for automobiles to drive in a day from one of these metropolitan cities to the other.

Jordan Warns That Traffic Problem Will Be Overwhelming

President of Jordan Company Points to Dangers and Asks That City Act

CLEVELAND, Oct. 22.—The automobile is piling up a traffic problem that neither the motor vehicle manufacturers, retail merchants or buyers of cars can afford to overlook, according to Edward S. Jordan, president of the Jordan Motor Co., of this city.

Ten conditions in connection with automobile traffic will cause a jam in the business sections of 50 American cities within 5 years unless these facts are immediately realized and corrective measures started, says Jordan. Here are the conditions he predicts.

1—Four million automobiles, added to 10,000,000 in use one year ago, will be augmented by the productions of more than 4,000,000 in 1924.

2—Retail merchants will soon find that while their front doors are barricaded by six or eight automobiles the property of six or eight owners, 60 or 70 customers are roaming around looking for a place to park their cars.

3—Every roomy and bulky car that is driven by father will be augmented by at least two for mother and the children.

4—No policeman, silent or noisy, will be able to handle the traffic that is coming. Only millions and millions of feet of new floor space for the parking of cars will be able to handle the traffic that is coming.

5—Workhouse and penitentiary sentences will not solve the problem. More floor space and higher speed for automobiles are essential.

6—The growth of population and of business will be in direct ratio to the amount of space provided for the movement of transportation.

7—The question of the saturation point is answered in three words—"They won't walk."

8—No motor cars will be parked at the curb. Most streets will be one way thoroughfares.

9—Tax payers will awaken to the fact that the cost of parking space outside of the congested area, and wider streets, will double then triple, then quadruple as the real estate owners discover the necessity for providing more space. Millions can be saved by any city that takes the first step.

10—Street cars and crowded streets are now almost obsolete, except as incubators for automobile prospects.

MAKES A NEW WHEEL

DETROIT, Oct. 19.—The Newport News Shipbuilding & Dry Dock Co. has entered the automotive field and will manufacture the Flex-sil-ient steel wheel, which is on display this week at Detroit's closed car show. Its feature is a new shock absorption principle.

Chamberlain Reports Information Requests On Used Car Plan From Over 20 Cities

DETROIT, Oct. 20.—Percy Chamberlain reports requests from over 20 cities for information on his plan to organize the used car business of the country under the Appleby motor marts. These were the result of telegrams sent out by him following the announcement of the plan to the group of trade association officials here two weeks ago, and represent the first response of the trade generally to his undertaking.

The cities responding were Birmingham, Ala., Denver, Atlanta, Evansville, Ind., Topeka, Worcester and Springfield, Mass., St. Paul, Newark, N. J., Albany, Sullivan, Ill., Cedar Rapids, Saginaw, Mich., Minneapolis, Syracuse, Cincinnati, Youngstown, Columbus, Dayton and Toledo.

First organization work under the plan was started last week in Indiana and Iowa, James E. Appleby, the originator of the plan, speaking in South Bend, Ind., Indianapolis and other cities in Indiana. Paul E. Brophy spoke in Cedar Rapids, Iowa, and in Davenport and Des Moines.

Kate L. Loomis, president of the Cedar Rapids dealers' association, declared at the meeting here that Iowa would be the first state east of the Pacific to come under the Appleby plan banner, and in saying this she declared she voiced the sentiment not only of the Cedar Rapids organization but of Iowa dealers generally.

On the Pacific coast, where there are 23 cities now operating under the Appleby plan, 16 cities in California and seven in Washington, the work of organization of other cities is being carried forward directly by state association secretaries. San Francisco dealers have appointed a committee to investigate the plan, as have dealers in Salt Lake City, and it is expected that both cities will soon be enrolled.

The California cities organized are San Diego, Fullerton, Santa Anna, Anaheim, Riverside, San Bernardino, Santa Barbara, Sacramento, Vallejo, Santa Rosa,

Santa Cruz, Imperial, Petaluma, Watsonville, Oakland. The Washington cities are Aberdeen, Hoquim, Montesano, Elma, Ellensburg, Olympia and Everett.

Numerous inquiries are reported by Chamberlain from bankers and from officers of finance companies. The meeting in Detroit was attended by a representative of the Commercial Investment Trust, which previously had expressed great interest in the plan following a meeting of officers of that company with Chamberlain in New York.

Arrangements required by Chamberlain for meetings under the plan of organization are as follows:

1. Night meeting. No music, food or entertainment. Strictly business.

2. A meeting of executives—men who can decide the firm's policies.

3. Each executive will bring his sales force, or at least his leading salesmen.

4. Each interested organization will pay \$50 to a preliminary fund, the purpose of which is to defray the expenses of sending a qualified representative to explain the Appleby plan at the meeting and to guarantee executive attendance as stated above.

5. When at least 10 organizations have paid this amount, a check for \$500 will be mailed to the Detroit office, following receipt of which the first available date will be definitely assigned and confirmed.

6. Should more than 10 dealer organizations attend, each one is to pay \$50 and the additional amounts will be sent direct to the Detroit office or paid to a representative at the time of the meeting.

7. Upon receipt of the guarantee check a supply of "Underwriting Receipt" forms will be mailed for use.

8. An invitation to the meeting is to be extended to the bankers of the city and every effort made to secure their attendance.

9. Should the meeting not be held within a reasonable time for any reason the full amount of the guarantee fund will be returned.

100 FORD DEALERS MEET

ST. LOUIS, Oct. 19.—Ford and Lincoln dealers of the St. Louis District including two-thirds of Missouri, one-half of Illinois and Western Kentucky held a convention here last week at the Claridge Hotel. About 100 dealers attended. The business meeting was presided over by C. S. Williams, manager of the Ford branch here.

TRACTORS VIA WATER

HOUSTON, Tex., Oct. 20.—The first shipments of caterpillar tractors to arrive in Houston via water reached F. W. Gartner Company here this week from the Holt factory at Stockton, Cal. The shipment consisted of 16 Hols and came via the Panama Canal.

DEALERS RALLY

SAN FRANCISCO, Cal., Oct. 22—Approximately 3,000 members of the automotive industry in San Francisco, their families and friends, attended the first annual rally of the San Francisco Motor Car Dealers' Association and the San Francisco Automobile Trade Association, at Pacific City, on the ocean beach a few miles south of here, Oct. 7. Outdoor sports, an automobile parade in which the cars were driven by bathing beauties, a barbecue and a dance in the evening furnished the entertainment.

Committees in charge of the event were headed by Ray Brouillet, Frank Carroll, Jack Flynn, Charles Nagle, James Bacchus, Louis Cohn and William LaRue, all well-known in the industry in northern California.

CONCERNING MEN YOU KNOW

E. H. McCarty, general sales manager of the Nash Motor Co., of Kenosha, Wis., recently made a business trip throughout the southern territory, visiting the various Nash dealers and distributors in that section. Southern business, McCarty stated while in Atlanta, is the largest it has ever been in the history of the Nash company, with all dealers throughout the district very optimistic over the future outlook.

Leroy Brookshire, manager of the South Carolina district for the White Co., with headquarters at Greenville, S. C., and Miss Margaret Wearn, of Charlotte, N. C., were married this month at the latter city. Brookshire has been several years with the White Co., formerly being located at the Charlotte branch, recently taking charge of the South Carolina territory.

George Gates, retail sales manager for some time for Claude Nolan, Cadillac distributor at Jacksonville, Fla., has been appointed district representative by the Cadillac Motor Co., and will temporarily be assigned to northern territory. Cecil C. Robertson, formerly manager of the Savannah, Ga., branch for Nolan, has been named retail sales manager at Jacksonville to succeed Gates.

Paul N. Spain, Austin Building, Dubuque, Ia., has taken a position as special field man on shop equipment for the Manley Mfg. Co. He formerly was Chicago district representative of the Manley company.

Griff Vance, formerly sales manager for the Jack Neal Nash Motor Co., of San Antonio, Tex., has been named assistant general manager of that company.

William R. Dorney has been appointed representative of the Corcoran Mfg. Co., of Cincinnati, in the territory east of Pittsburgh and along the Southern Atlantic Coast. He succeeds Joseph P. McCarthy who resigned to engage in other business. Roscoe Hovatter also has been added to the company's staff to work in the southern and central states. The company manufactures automobile fenders, hoods, radiators and tool boxes.

R. T. Mathewson, district manager of the SKF Industries, Inc., of Buffalo, retires from that position Nov. 1 to devote his entire time to the development of the products of the Nichols & Wright Motor Co., of Buffalo. He is to be succeeded by Robert R. Hirsch, transferred from the Philadelphia office. Mathewson has been with the SKF Industries since its organization, prior to which he was with the SKF Ball Bearing Co., of Hartford, Conn.

V. H. Day, general sales manager of the General Motors Truck Co., of Pontiac, is visiting all his district sales managers in the West and along the Pacific Coast for the purpose of reviewing transportation conditions throughout the entire Western and Pacific Coast territories, where heavy demands for trucks are expected in the farm territories of the Northwest.

F. L. Leeds has disposed of his holdings in the Monogram Lens Corp. and will announce his future plans shortly.

Harry S. Sternberg has been appointed sales manager of the Blakely Manufacturing Co., of Detroit, maker of automobile shipping fastenings. Charles A. Goodspeed, factory manager, will continue in charge of manufacturing and W. D. Blakely will devote his attention to the development of new lines.

James J. Flynn has resigned as sales manager of the Durant Motor Co. of New Jersey, with headquarters at Elizabeth. Flynn joined Durant in 1922 after seven years' connection with the Chevrolet Motor Co. at Baltimore and Cincinnati.

A. C. Lindholm has been named as representa-

tive of the Van Norman Machine Tool Co., of Springfield, Mass. Lindholm formerly was general manager of the Franklin Machine & Tool Co., which recently was merged with the Van Norman company and has had wide experience in the production and use of precision machine tools.

John L. Esser, formerly a partner in the Esser Brothers Motor Co., of Boonville, Mo., has been appointed postmaster in that city.

R. E. MacKenzie, after four years' service as advertising manager of the Timken Roller Bearing Co., of Canton, O., has resigned his connection. He is succeeded by L. M. Klinedinst, who will also continue as assistant manager of sales. Carter Miller will be actively in charge of the advertising department, with the title of assistant advertising manager. Miller has been five years with the company and until recently was district manager of the service department.

The Chevrolet Motor Co. announces the appointment of M. D. Douglas as regional sales manager in the southeastern territory, which comprises the Atlanta, Charlotte, Louisville and Cincinnati zones. The southeastern is a new region in line with the company's plans, Douglas states, to concentrate its sales facilities with the rapid growth of its dealer organization in this district.

J. Budd Bleiler has been appointed as general sales manager of the Howe Tire & Rubber Corp., with headquarters at the factory, New Brunswick, N. J. Bleiler has been in the tire business since 1908, at which time he started with the Diamond Rubber Co. Later he acted as factory representative for the Republic Rubber Co. and during the past few years has been with the Fisk Tire & Rubber Co. as factory representative, calling on automobile manufacturers. Until recently the sales and advertising offices of the Howe Tire & Rubber Corp. have been maintained in Cleveland. R. T. Christy has been appointed advertising manager, with headquarters at New Brunswick, also.

Colin Mabeth, experimental and development engineer of Birmingham, England, and one of the outstanding authorities of the rubber industry, has arrived at the Dunlop Tire & Rubber Co., Buffalo, N. Y. He will confer with Dunlop officials on the possibilities of development of the balloon tire in America.

Jack Meehan, for several years manager of the Brunner Mfg. Co., air compressor manufacturer in Utica, N. Y., is to become manager of the Research Club with headquarters in Chicago Nov. 1.

M. P. Wollering, vice-president in charge of manufacturing of the Studebaker Corp., E. J. Miles and Vincent Link, consulting engineers, and R. E. Scratch, assistant to Wollering, sailed on Oct. 13 on the steamer Majestic for Europe where they will attend the continental automobile shows.

Four factory district representatives have been added by the Peerless Motor Car Co. to care for business in the eastern, southern and middle-western sections of the country. J. H. Lis is former widely-known Atlanta distributor. has been placed in charge of the states of Alabama, Georgia, South Carolina and the eastern half of Tennessee. H. V. Neff, formerly a branch manager in Memphis, is in charge of Mississippi, Louisiana and Arkansas, in addition to the eastern half of Missouri, southern Illinois and western Tennessee. R. L. Bunn has charge of Peerless business in Wisconsin, Minnesota, Iowa, Nebraska and Colorado. F. M. Benson, former factory representative for another automobile company, is in charge of the states of New York and Vermont, in addition to eastern Canada.

U. S. Officials Discuss Plans to Remove Snow From Roads

Effort Will Be Made to Keep Main Highways Open for Winter Traffic

WASHINGTON, Oct. 19.—Plans for keeping the main highways open during the winter months in order to maintain the highway transport service between the principal cities are now under consideration by the Bureau of Public Roads, Department of Agriculture, and state highway officials throughout the country. The Federal Bureau has detailed J. D. McCord, a highway engineer, to conduct a study of the situation and submit a detailed report.

The increasing number of motor truck fleets will undoubtedly necessitate intensive work on the part of the various state highway departments in keeping the roads open to this traffic. Heretofore appropriations for clearing snow from the highways have been extremely small and the promises of the state engineer to keep considerable mileage open have in many instances fallen short of fulfillment. Highway engineers find that cost data is very scarce as this work is practically new.

Organizations Join to Keep Highways Cleared of Snow

SYRACUSE, N. Y., Oct. 20.—All automobile organizations here will join in a state-wide campaign to keep the main highways cleared of snow during the winter months. The Syracuse Automobile Dealers' Association has completed a survey on dealer sentiment and finds that all dealers here are anxious for the innovation on an organized scale, with the state, county and city co-operating. The local dealers will work through the New York State Automobile Merchants' Association for a state appropriation, and will also go to the board of supervisors to obtain a county fund for this purpose.

The State Auto Bus Association, which met here a few days ago, is also lining up a campaign to obtain recognition of the need of snow removal. An amendment to the state highway law will be asked by the bus men. They want snow removal on all roads where more than 500 cars pass a given point 12 hours a day.

GAS PRICE DECLINE

NEW YORK, Oct. 19.—The average tank price of gasoline in 30 representative cities has declined .67 cent since Sept. 18, a new low of 15.12 cents having been set. This is a decrease of 3.96 cents from the average of July 30 and a total reduction of 5.99 cents from the high of 1923. Jan. 1, 1921, the average price was 29.3 cents. Dallas, Tex., is selling the cheapest gasoline at the present time, 9 cents being quoted, while Wilmington, Del., is high with 20 cents.

ANNUAL MEETING AT ATLANTA

ATLANTA, Ga., Oct. 22.—C. V. Hohenstein, executive secretary of the Atlanta Automobile Association, has announced that the annual meeting of the association will be held Monday, Dec. 3, at the Capital City Club, at which time officers for the coming year will be elected, and plans of association activities for 1924 thoroughly discussed.

TRUCKS FOR JAPAN

BUFFALO, N. Y., Oct. 23.—The Pierce-Arrow Motor Car Co. has received an order for 50 two-ton trucks from the Imperial Japanese National Railroads. These trucks are to be used for reconstruction at Yokohama and Tokio and afterward for short haul freight transportation. This is Pierce-Arrow's third order from Japan since the earthquake.

BUSINESS NOTES

Gaul, Derr & Shearer Co., Sixteenth and Fairmount avenue, Philadelphia, distributor of automotive equipment, held a house warming Oct. 15 to 20 to celebrate the opening of its new place of business. Special features included a practical demonstration of the reconditioning of a used car, show windows illustrating Christmas displays for dealers and a dealers' meeting at which Ray W. Sherman and L. A. Safford were speakers. The motion picture, "An Automotive Christmas," was shown.

The Jolite Co., of Milwaukee, which with a companion corporation, the Jolite Tool Co., was recently organized under the laws of Wisconsin, will manufacture a high speed tool steel made under patented processes of treating developed during the past 15 years by John Last, of Milwaukee, from whose name the new steel derives its title.

Louis C. Block, president of the Philadelphia Automobile Trade Association, and H. P. Schade have formed the Gabriel Snubber Sales and Service, with headquarters at 823 North Broad street. They will erect a new building to handle exclusively Gabriel snubbers. The territory covered will include eastern Pennsylvania and southern New Jersey.

Following an investigation by John Garver and R. Allen Gibbons of the Better Business Commission of Buffalo, N. Y., into the activities of the Angola Tire & Rubber Co., its subsidiary company, the Angola Sales Co., and the merchandising business conducted under the title of the Angola Auto Club, Alfred C. Bidwell, directing head of the company, has promised to drop all stock selling. The company was incorporated in 1917 with a capital stock of \$1,000,000 to manufacture and sell tires and accessories. Investigation disclosed, it is alleged, that the company had never manufactured a tire or any accessories, although salesmen had sold \$746,520 in stock up to Dec. 31, last year.

C. B. Mercer has acquired control of the Central Auto Body Co. of East Hartford, Conn., buying out his two partners and will continue the business at 15 Orchard street under the name C. B. Mercer Auto Body Co., successor to the Central Auto Body Co. Mercer founded the business several years ago and it has assumed sizeable proportions.

The Universal Wheel Co. Ltd., Windsor, Ont., manufacturer of a new disc wheel for the automobile trade, has leased the plant of the Universal Button Co., on Walker Road and will start production in about 60 days.

The Auto Finance Corporation of Beaumont, Tex., has been incorporated with a capital stock of \$20,000.

Drastic Reductions on All Locomobile Models Announced

BRIDGEPORT, Conn., Oct. 20—Drastic reductions in the price of the Locomobile cars ranging from \$1,000 to \$2,600 have been announced by the Durant Motors Co. The biggest drop is made on the Limousine, which now lists at \$9,000 instead of \$11,600. The four-passenger sport phaeton is cut from \$9,500 to \$7,900.

The following table shows the old and latest prices:

	Old Price	New Price
4-passenger phaeton	\$9,500	\$7,900
7-passenger phaeton	9,600	7,900
5-passenger sedan	12,200	11,200
Coupe-limousine	11,750	10,600
Limousine	11,600	9,000
Cabriolet	12,200	11,200

200 TIRE DEALERS MEET

ATLANTA, Ga., Oct. 20.—Approximately 200 dealers from the southeastern territory attended the annual fall convention of the General Tire & Rubber Co., held this week in Atlanta, at the company's southeastern branch. Dealers present advised that tire business over

The Fyrac Manufacturing Co. of Rockford, Ill., and the Clymer Manufacturing Co., of Denver, have cross-licensed each other for the manufacture of through-the-windshield spot lights. Both companies have patents and patents pending on through-the-windshield spot lights and a special tool for cutting a hole in the windshield without removing the glass. These patents include the basic Vallot patent.

A factory branch of the Dunlop Tire & Rubber Co., of Buffalo, will be established in Atlanta in the near future at 557 Whitehall street, to handle the southeastern territory, it has been announced by F. H. Sawyer, of Philadelphia, district sales manager, who, with L. W. Kennedy, will probably be in charge of the branch. At present temporary headquarters for the district have been established at 1107 Flatiron Bldg., Atlanta.

The Bryan Harvester Co., Inc., of Peru, Ind., manufacturer of the Bryan Light Steam tractor, has announced a reduction in the price of the tractor of \$115, making the present list price \$2,385.

The Reliance Manufacturing Co. of Cedar Rapids, Ia., which makes pistons and piston rings, has occupied its new building at 1016 Second avenue, which will enable it to handle a greater volume of business in quicker time.

The Wichita Falls (Tex.) Automobile Dealers Association has been incorporated. The capital stock is \$1,000. Among the incorporators are W. S. Langford, L. A. Brown and C. C. Randle.

A new expanded steel passenger car wheel is announced by the Smith Steel Wheel, Inc., Syracuse, N. Y. The new wheel combines light weight and attractive appearance with great tensile strength. The wheel is a refinement of the truck wheel made by the company. It is cast in one piece from a special metal alloy, and is hollow through its entire structure. Internal braces give the wheel strength.

The Automobile Security Lock Co., organized at St. Petersburg, Fla., with \$50,000 capital, is contemplating the establishment of a plant for the manufacture of a new automobile lock, according to a recent announcement by officials of the company.

The Schuster-Adams Chemical Co. completed its organization recently at a meeting in Washington, D. C., and has been issued patent rights for this country for inventions and processes in the production of electricity in dry cell batteries known as the "Schuster electrolite." Several business men of Macon are financially interested in the new company, as is also ex-Senator Hoke Smith, of Atlanta. The company will establish at Macon at an early date a large plant for the manufacture of electric batteries.

the district has been considerably better than last year the past month, but experienced a very dull period for a time shortly after the manufacturers had announced reductions in prices.

C. A. T. A. IN PARADE

CHICAGO, Oct. 20—The Chicago Automobile Trade Association participated in a parade this afternoon and a banquet this evening at the Edgewater Beach Hotel, celebrating the formal opening of a new northbound boulevard through Lincoln Park. At the same time support was given to the Lincoln Park commissioners for the construction of additional roadways which will "break the bottle's neck" which confines all traffic from the north side to the loop.

SEEK SWINDLER

ST. LOUIS, Oct. 20 — The National Automobile Dealers' Association, with headquarters here, requests that all members report to it at once any information they obtain about a man who is said to be soliciting memberships at \$25 each in the "National Automobile Service Association."

Harlan Fengler Drives Wade Special to K. C. Victory

Wins 250 Mile Grind at Average of 112.8 M. P. H.; Jimmy Murphy Second

KANSAS CITY, Oct. 22.—Driving at an average speed of 112.8 miles per hour, a world record for the new type of one man racing cars of 122 cu. in piston displacement, Harlan Fengler, in a Wade Special, won the second 250 mile race to be run over the 1¼ mile Kansas City speedway Oct. 21. The official time of the race was 2 hours, 12 minutes and 55 2/5 seconds. The Wade Special is powered with a Miller engine.

Jimmy Murphy, in a Durant Special, was second; Eddie Hearne in a Durant Special was third; Harry Hartz, who replaced Jerry Wonderlich in a Durant late in the race, was fourth. The others to finish were Bennett Hill, fifth; Dave Lewis, sixth; Frank Elliot, seventh; Ralph DePalma, eighth, and Leon Duray, ninth. Cars driven by Earl Cooper, Tommy Milton, Harry Hartz, Ora Haibe and L. L. Corum were forced from the race with engine trouble.

There were no accidents. Of the nine cars that finished only three of them were able to go the entire distance without going to the pits. These were driven by Fengler, Hearne and Elliott.

Dollar Corn and Bumper Crop Spells Prosperity for These

BLOOMINGTON, Ill., Oct. 20.—Dollar corn, reached for the first time in three years, climaxing a bumper crop, the greatest in years, and which is now safely beyond the danger line from frost, spells prosperity in central Illinois where this grain constitutes the bulk of agricultural resources. With an estimate of 375,000,000 bushels for the state, nearly 20 per cent greater than last year, and with a far higher price, the Illinois farmer will likely be \$100,000,000 better off this year than in 1922.

This is regarded as especially favorable to the motor car and power farming industry. After three lean years, the farmers will come into their own again. Their "strike" is off. They are now in a position to buy and those who have been worrying along without a motor car, or with one which has outlived its usefulness, or with wornout machinery and implements for taking care of their crops, will probably invest before many months have passed.

So impressed with the certainty of improved conditions are most of the motor car dealers of central Illinois, that they are placing some noteworthy contracts for the coming year. Many are of staggering size and which would have been regarded as suicidal and impossible two years ago. Illustrative of this era of optimism, is the contract just closed by the Elliot-Van Brunt Co. of Springfield for the delivery of no less than 800 Overland and Willys-Knight cars for 1924.

IN THE RETAIL FIELD

The Hansen Motor Co., Brigham City, Utah, will erect a new home of its own on North Main street.

The Peerless Motor Car Co., has opened its own factory branch at Kansas City, caring for wholesale and retail distribution and service, formerly handled by the Koup Motor Co. L. D. Sasser of the Peerless factory organization is manager of this branch. H. M. Genung, well known in motor circles, has returned to the motor car field, as sales manager of the Peerless branch.

The McEleney Auto Co., Lyons, Ia., has been named agent for the Chevrolet car and truck and the Reo speed wagon in its territory.

L. O. Mitchell and A. L. Bowman, who conduct the Maxwell agency in Quincy, Ill., have taken on the Jordan agency.

Vesper-Buick Automobile Co., St. Louis Buick distributor, has added two new traveling representatives to the wholesale sales force. W. L. Hoffman will travel the northern half of Missouri as wholesale salesman. E. B. Moore will cover all the territory included in that portion of Missouri, Illinois and Kentucky under the direction of Vesper-Buick as a general representative on parts and service.

Dave C. Castles, formerly associated with Walter H. Vesper in the Vesper Motors Co., Reo and Dort dealer in Oklahoma City, has purchased the interest of W. S. Roberts in the West Side Buick Auto Co., 5032 Delmar Blvd., St. Louis, and succeeded Roberts as president and treasurer of the company. Roberts says he plans to stay in the automobile business in St. Louis but is not yet ready to announce his plans.

The Avenue Motor Co., 5810 Euclid avenue, Cleveland, which until recently was local distributor for the Chalmers and Maxwell cars, has taken over the agency for the Paige and Jewett cars.

J. A. Ferguson has been made wholesale manager for the Paige-Ohio Company with Cleveland and outlying territory in his district. He has been with the Studebaker distributing agency in Lima, Ohio, for the past two years.

Joe Kelso of Trenton, Mo., has added the Maxwell car to his agency. He was already selling the Studebaker and Chevrolet.

The Woleben Motor Sales Co., has been chartered at Toledo, O., with a capital of \$30,000 to buy, sell and deal in automobiles, trucks, parts and accessories. Incorporators are A. W. Woleben, J. W. Broughton, R. S. Holbrook, C. R. Banker and J. D. Jackson.

The Cadiz Garage Co., at Cadiz, O., has been incorporated with a capital of \$25,000.

The Bennett Hartford Co., 345 Connecticut Blvd., East Hartford, Conn., has moved its sales department to 256 Main street, Hartford, and its service department to John street. The latter is a new structure.

The Ford Motor Co. branch at Charlotte, N. C. reports the appointment of dealers as follows: Turrentine Motor Co., Tarboro, N. C.; Jones Car Motor Co., St. Pauls, N. C.; Perry Motor Co., Southport, N. C.; Reasley Motor Co., Joyner Motor Co., Roanoke Rapids, N. C.

The Alexander Motor Co. at Durham, N. C., Ford dealer, is just completing a new garage at a cost of \$125,000.

C. T. Hampton has opened a garage and sales station at Rutherfordston, N. C. He will handle Hudson and Essex cars.

Sadler Bros. Motor Co. of Iva, S. C., has taken over the Ford agency at Anderson, S. C. They will discontinue the Iva business.

S. N. Shepard of Charlotte, N. C., will open the "Hat-in-the-Ring" Motor Co. at Winston-Salem, N. C., for the distribution of Rickenbacker cars in that territory. He will announce a number of dealers in a short while.

The Australasian Auto Import Co., Ltd., of Auckland, New Zealand, has been appointed Haynes distributor for New Zealand, according to an announcement by Col. Fred C. Cardway, director of exports for the Haynes Automobile Co., Kokomo, Ind.

Grinham-Johnson Motor Sales Co., Chevrolet dealer at St. Louis, recently concluded a baseball league sales contest in which its salesmen were grouped in teams. Points were awarded for base hits determined by sales made. The team captained by J. J. O'Neill won first prize, a silver loving cup. A smaller cup was awarded to the second team captained by W. J. Daugherty. Leading hitters on the two teams were awarded gold watches. The prizes were presented at a meeting presided over by Robert E. Lee, sec-

retary of the St. Louis Automobile Dealers' Association.

M. D. Baker, former Prest-O-Lite battery dealer in Portland, Ore., has taken over the Chandler and Cleveland line in the Portland territory. For several months past the line has not been represented in Portland. Baker was formerly manager for the Seattle Chandler distributor, and also was for a time Chandler dealer in Yakima, Wash.

In connection with the nineteenth anniversary observance as distributor of the Ford in northern Connecticut the Elmer Automobile Co. kept open house in each of its 11 branches.

The Central Motor Car Co., Hartford, Conn., distributor of the Moon has taken on the Chevrolet as an associate dealer.

The garage and sales agency of the C. W. Frey Motor Car Co. of Bloomington, Ill., situated directly across the street from daily newspaper office which gave the result of the world series in baseball, play by play, saw a chance to capitalize the fortunate location of their plant and rented several hundred chairs and then invited friends to occupy them and follow the results of the various games, with the utmost comfort. It is needless to say that these chairs were occupied early and were in great demand. The enterprise of the firm was greatly appreciated and will likely have some substantial returns in the way of car sales.

H. R. Johnson, Brimfield, Ill., has purchased a lot 60 by 100, upon which he will erect a garage and sales agency which will be one of the largest plants in that place. It will be ready for occupancy by Jan. 1.

Nineteen retail dealers are handling the new Oakland line in Chicago. These include the five stores of Community Motors, Inc., at 6626 South Halsted St., 5714 Broadway, 6529 Cottage Grove Ave., 2554 Milwaukee Ave., and 914 Diversey Parkway, and the following: Oakland Motor Car Co., 2426 South Michigan Ave.; Colorado Auto Sales Co., 3324 Jackson Blvd.; Bodinet Motor Sales, 4306 Elston Ave.; Fullerton Motor Sales, 3716 Fullerton Ave.; Garfield Motor Sales Co., 49 East Garfield Blvd.; Jefferson Park Motor Sales, 4948 Milwaukee Ave.; The Avenue Garage, 830 North Blvd., Oak Park; Keane Motor, Inc., 1641 Milwaukee Ave.; Warner Motor Sales, 3637 Southport Ave.; West End Motors Corp., 4634 Washington Blvd.; G. W. Fleischmann Motor Sales, 10230 South Michigan Ave.; Dee Bee Motor Sales, 3035 West Grand Ave.; Marquardt Oakland Co., 3842 Ogden Ave.; South Shore Oakland, 7048 Stony Island Ave.

The Chicago Flint Co., 2500 South Michigan avenue, distributor of Durant's new six-cylinder Flint car, has announced the appointment of 11 community dealers to retail the Flint in Chicago and vicinity. They are: Eagle-Flint Motor Sales, 1626 Milwaukee Ave.; Irving Park Flint Co., 4140 Irving Park Blvd.; Harvey Flint Co., 15330 Center Ave., Harvey, Ill.; Retzke Motor Sales, 2440 Milwaukee Ave., Chicago; Flint Motor Sales Co., Inc., 330 E. State St., Hammond, Ind.; Broadway Flint Co., 5721 Broadway, Chicago; Lawndale Flint Sales, 3717 Ogden Ave., Chicago; Milford Motor Sales, 3356 Milwaukee Ave., Chicago; Gary Flint Co., 308 West Fifth Ave., Gary, Ind.; Roseland Flint Motor Sales, 10935 South Michigan Ave., Roseland, Ill.; Kenilworth Garage & Auto Laundry, 916 Madison St., Oak Park, Ill.

The Taylor Motor Co., 46 East North Ave., Atlanta, has been named distributor in the state of Georgia for the Moon car, and is now closing contracts with local and sectional dealers to handle the Moon in various sections of the state where it is not now actively represented.

The Gayle Motors Co., Government and St. Emanuel streets, Mobile, Ala., has been appointed district distributor for the Studebaker line in Mobile territory, including fourteen counties in South Alabama and Mississippi and North Florida. The company also handles the Durant and Star line.

The Oakland Motor Car Co., of Atlanta, states that the P. D. Beville Supply Co., of Mobile, Ala., has been named to handle the Oakland car as dealers in Mobile and the adjacent territory.

The Sweeney Vann Co., of Swainsboro, Ga., one of the largest Ford dealers in that section of the state, has been purchased by George C. Peebles from G. F. Sweeney, and the name of the firm has been changed to the Vann Motor Co., with Peebles in active charge.

The Nicholson, Davis, Brown Co. has been chartered at Knoxville, Tenn., with \$50,000 capital, and has taken over the distributorship of the Durant and Star line in that section of East

Tennessee. Until the company erects a new building in the next few months headquarters are temporarily at 217 Depot Ave.

The Roy Iverson Co., 2330 South Michigan avenue, Chicago, Dorris dealer, has added the Apperson to its line.

Locht Bros. Auto Sales Co., 11400 South Michigan avenue, Chicago, has been appointed Velie dealer by R. C. Cook & Co., Chicago Velie distributor.

The Schmidt Motor Sales Co. has been organized at Oak Park, Ill., and will open a sales agency at 46 Roosevelt road. Capital stock has been fixed at \$2,500.

H. E. Bowling of Edina, Mo., has made a direct contract with the Chevrolet Motor Co., to handle their line in Knox County, succeeding J. L. Kinsel. The new business will be conducted under the name of the Bowling Motor Co.

Everett Ramsey, Weldon, Ill., has opened a new garage and sales agency.

The Wentzel-Foster Motor Car Co. has been organized at Aurora, Ill., and will operate a garage and sales agency at 7 to 11 South Lake street.

Harry Starkie, Hartford, Conn., former distributor of the Chevrolet in Hartford County, has retired from business and announces no plans as to the future.

Branham & Phelps Motor Co., of Albany, Mo., has leased the building which adjoins its garage, and will remodel it into a neat and attractive sales room for the display of Buick and Chevrolet cars.

Charles Edson, proprietor of the Edson Motor Co. and the Edson Battery Co. of Bethany, Mo., recently sold the Willard battery station to Jerry Carson and Roy Arkle.

New automobile agencies formed in the Southeast since the first of October include the following: Ransford Motor Co., of High Point, N. C., with \$50,000 capital; Maxton Motor Co., of Maxton, N. C., with \$20,000 capital; Halsey-Trott Co., of Charleston, S. C., with \$5,000 capital; Harder Motor Co., of Cedar Key, Fla., with \$12,000 capital; W. J. Tate & Co., of Chiefland, Fla., with \$50,000 capital.

New accessory, garage and tire dealer firms formed in the Southeast are as follows: Chiefland Garage, Inc., of Chiefland, Fla., with \$10,000 capital; The Tire Co., Inc., Spring Hill and Scott streets, Mobile, Ala.; Central Service Station, of Orlando, Fla., with \$24,000 capital; Auto Parts Co., of Hattiesburg, Miss., with \$10,000 capital.

The Savannah Motor Co., of Savannah, Ga., is now permanently located in newer and larger quarters at 22 Drayton St., formerly occupied by the Dimmitt-Buick Co. The latter concern is now located in its new building at that city. The Savannah Motor Co. distributes in that territory the Jordan, Oldsmobile, Hupmobile, Durant and Star cars.

The Overland-Knight Sales Co. is a new firm recently organized in Des Moines for sales and service on Overland and Willys Knight automobiles. C. S. McKee, formerly connected with the retail sales department of the Clemens Automobile Co. of Des Moines, will have charge of the new concern.

The Willard Storage Battery Co. has opened a factory branch at Sixteenth Street and Grand Avenue in Des Moines, Ia. Alfred J. Strong, of Springfield, Mass., will have charge of the branch.

The Andrews Chevrolet Co., one of the new retail Chevrolet dealers in Des Moines, has moved to Fifth Street and Grand Avenue. Earl Andrews is owner and manager of the company.

The Hornell Auto Electric Service, Inc., was recently incorporated to do business in Hornell, N. Y.

Milwaukee Oldsmobile Sales Co., 559-561 Broadway, Milwaukee, has changed its corporate style to Steinbach-Berry-Groesch, Inc., and while retaining a retail Oldsmobile franchise in the city of Milwaukee, has accepted the distributorship of the Case in Milwaukee and southeastern Wisconsin. P. H. Hustis, formerly Case distributor, has relinquished this franchise to become a community Overland and Willys-Knight dealer in Milwaukee.

Healy-Larson Co., Milwaukee, distributor of the Stephens in the Wisconsin territory, has moved its headquarters from 452 Jackson Street to 451-453 Jackson Street, opposite the former location.

Lawson Motor Car Co., Racine, Wis., will occupy a \$65,000 sales and service building, 82x120 ft., two and three stories, now under construction for the Racine Investment Co., 401 Lake Avenue, Racine.

Madison Nash Co., 155 East Wilson Street, Madison, Wis., has broken ground for a new automotive sales and service building, 75x155 ft., part two and three stories, costing \$65,000. Ray A. Dillon is president and general manager.

The READERS' CLEARING HOUSE

Questions & Answers on Dealers' Problems

Hot Generator Epidemic. Here's Another

Q—What makes a Remy generator, on model T Reo car, run hot? It has been tested out and does not show any ground or short and the commutator has been turned. The brushes and bearings are in good condition. It will only put out 10 or 11 amperes, with the third brush advanced as far as it will go, and yet it runs so hot one can hardly bear a hand on the generator.—W. H. Davis, Shreveport, La.

This generator incorporates a thermostat, connected in series with the shunt field and located inside the commutator cover. When cold this thermostat normally has the points touching each other so that the resistance on it is shorted out, giving maximum field current and maximum output of the generator.

As the generator heats up the contacts are supposed to open, so that the resistance is thrown in series with the shunt field, thereby cutting down the output. It occurs to us as a possibility that the contacts do not touch, and that you are forcing the thermostat to carry current by advancing the third brush.

Another cause of heating is main brushes which are not on neutral and cause arcing and consequent heating at the commutator. To check a generator for neutral setting of the main brushes, it is necessary to lift the third brush and connect a battery to the other brushes to allow it to operate as a motor. If it has any great tendency to rotate, it shows the brushes are not on neutral. If there is no tendency to rotate, it shows the brushes are on neutral, and it is sometimes considered permissible to have a slight tendency to rotate in the normal direction.

Another possible cause of trouble may be due to an armature which at some time or other has been allowed to drag on the pole pieces so that the laminations are shorted. This produces eddy current in the iron of the armature itself and these cause the armature to heat up.

Unless you have compared this machine with some other similar machine under similar circumstances, it is possible that the heating is normal, and it might be well to test it with a thermometer inserted under the commutator cover. The boiling point of water, which is 212 degs. Fahr. or 100 degs. Cent., is a permissible temperature.

Another possibility is that there is a partial short or ground which you have not located. The armature should be tested for shorts on a growler to see if it causes a hack saw blade to vibrate and also to see if the armature itself heats up from being on the growler. Tests for ground may be made with 110 volt test line, having a lamp in series.

The Readers' Clearing House

THIS department is conducted to assist dealers and maintenance station executives in the solution of their problems.

All questions are answered direct by letter, so the name and address should be given in full. This saves waiting for the answer to be published, which sometimes occurs several weeks late, depending upon the space available.

Readers' names will not be published with articles, if a request to this effect is received with the letter.

Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.

Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.

Addresses of business firms will not be published in this department but will be supplied by letter.

Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin; Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.

PISTON SLAP UNTIL EXPANSION REDUCES THE CLEARANCE

Q—We would like to have your opinion regarding a knock in a 1923 Dodge car that we have here. We took the pistons out of this car and put on new piston rings and one new piston pin bushing No. 3 rod. When we started the car after doing this we found it had a bad knock; whenever we gave it the gas real quick, it would make several hard knocks until the engine gained speed, then you would not hear anything more unless the motor was slowed down and then given the gas real quick.

After the motor is hot, we can hardly get the knock at all, but it is very loud in the morning or after the motor has stood long enough to cool down.

We took the motor down the second time and found No. 3 rods slightly out of line and the rod seemed to be very soft, so we put in a new one. The rods are all straight, all bearings and bushings in good shape, and the pistons fit well. These pistons are Lynite with the split skirt. We are unable to locate the trouble, but the knock is still there when the engine is cold, and now we can get it when we race the motor, but it is not very loud except in the morning on the first start of the engine.

If you could give us some idea of what this trouble is, we would appreciate it

very much. If you need any information other than what I have given you, let me know and I will try and supply it.—W. J. Kerlin, South Garage, Walton, Ind.

This knock is caused either by a piston with too much clearance, or from spark too far advanced, or a cylinder head having less compression space than the standard.

In the first place the Lynite split skirt pistons should have .005 of an inch clearance at the skirt when the engine and piston are cold. This means that when the engine is cold there will be a very pronounced piston slap which will be accentuated when the engine is accelerated suddenly. This accounts for the fact that the knock diminishes and almost disappears as the engine warms up.

The answer, to determine whether a knock is caused by too much clearance, is to micrometer the pistons and cylinders and determine the amount of clearance.

It is possible, and even probable, that when the pistons were removed, they were jarred and knocked out of shape at the skirt and if the engine was quiet in the beginning, it is possible that you could expand the piston skirt by pulling out on each half of the skirt at the slots. Great care must be exercised in this operation, however, because if the piston is enlarged too much it will scrape the cylinder and perhaps scratch the surface before it will contract at the slots when heated.

The next test is to set the spark as follows: Turn the engine slowly by hand until No. 8 valve, that is, the exhaust valve on No. 4 cylinder, has just closed. With the engine in this position and the spark control in full retard position, the points should just open.

If, after you have completed the two tests mentioned, the knock still is present, we would advise that you remove the cylinder head and add one gasket. In other words, operate the engine with two cylinder head gaskets. The trouble is due to the fact that there is a compression knock, due to too high compression, probably caused by cylinder head not milled out to the standard depth giving higher compression, which can be compensated for by the additional gasket.

CORRECTION

Q—We notice on page 45 of the August 23rd issue of Motor Age an article entitled, "Uses Cadillac Timing Chain on Packard." We wish to call your attention to the fact that the Cadillac car uses a Morse chain, and not a Link Belt chain as indicated in the article.—Joseph F. McMullen, Mgr., Service Department, Up-percu Cadillac Corp., Brooklyn, N. Y.

MOTOR AGE wishes to express appreciation for the above correction. The information printed was correct to the best of our knowledge but apparently we were misinformed.

More Prominent Location Will Sell the Accessories

Q—We are contemplating the erection of a two story garage, fronting 100 ft. on a corner with a depth of 120 ft. We handle repair work, battery work, machine shop, cylinder regrinding, parts department and employ 40 men. We are enclosing a rough sketch of the downstairs idea. Downstairs we wish to have an accessory store, ladies' waiting room, machine shop, battery department and washrack.

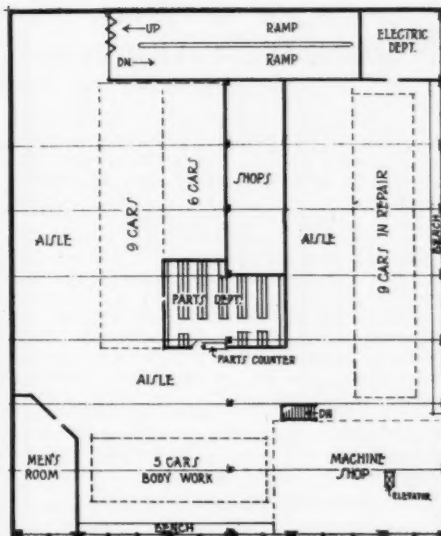
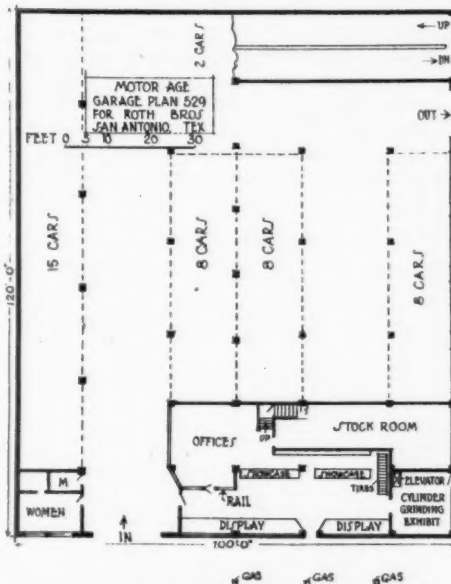
We wish the upstairs to have a men's dressing room, showers and parts department. The downstairs to be used for storage only and the upstairs for repair work. We handle no new cars. We have contemplated the use of a ramp and request that you also send us the specifications for a ramp that will accommodate two cars at one time and that will not be too steep, as we have to pull wrecks up same. We intend the use of four gasoline pumps at curb.—Roth Bros., San Antonio, Texas.

We have taken considerable liberties with the suggested layout that you sent us, principal among which are the moving of the machine shop to the second floor and the accessory store to a corner location. The only portion of the machine shop that we would feel justified in putting on the corner would be the cylinder regrinding department.

This might be worked up into a very nice exhibition if well laid out and kept clean and spick and span, so that it will attract a lot of attention and bring you considerable business in this line. There would, of course, be no overhauling done on the first floor, but the engine blocks could be prepared and cleaned on the second floor and brought to the cylinder regrinding department by a small dumb waiter or an electric elevator.

It is to be regretted that the building is not wide enough so that a ramp could start inside and still have an easy grade and room to turn at the top. The only way it could be started inside is to make the turn on the grade instead of on the level of the second floor. The ramp as laid out on our plan has a 17 per cent grade. A 15 per cent grade being considered ideal, this ramp is fairly easy.

We would not think it advisable to place four gas pumps in front of this building because by so doing the cars stopping for gas would interfere with



the cars entering and leaving the building. As a matter of fact, we think you would sell as much gas from two pumps as from four, because there is not suf-

ficient distance between them. Cars stopping at one pump will interfere with cars leaving from another if they are too close together.

VALVE TIMING IDEAS SINK IN SLOWLY—RESISTANCE PROBABLY HIGH

Q—In timing 1918, Buick, four cylinder valves, how can one tell if same is in time by the motion of valves, when marks on flywheel indicate 1-4 top center, where should the valves be? Give rule so that I can time them exactly, as it sometimes happens that in replacing new gears that they are punched wrong as it was in this case. Give all on above you can.

1—The question asked is entirely elementary and it is difficult to understand how an alive garage mechanic can continue doing business without a knowledge of valve timing. Motor Age will print, in the near future, a short article dealing with the actual timing of valves, which represents the practical side of what we printed in theory in the last installment of Engineering for the Serv-ice man.

The article in question appeared in the August 30th, 1923, issue of Motor Age, page 15, the heading being "Reasons Back of Ignition and Valve Timing." Should the article referred to be insufficient to enable you to time the Buick valves, we would suggest that you refer to the Encyclopaedia published by the school from which you graduated.

2—How can one time the Buick ignition by the marks on flywheel? Make this in inches and how do you measure?

2—Instructions for timing the ignition from the marks on the flywheel are clearly given in the Buick instruction book, covering the model on which you are working. We are herewith repeating these instructions as printed.

First, place the spark lever on the steering wheel in the fully retarded position.

Second, turn engine to 7 degs. mark which is approximately 1 inch from the dead center mark on flywheel with No. 1 cylinder on the firing stroke.

Third, loosen the timing adjustment screw in the center of the distributor

shaft and turn the breaker cam so that the rotor button will be in position under No. 1 high tension segment when the distributor head is properly located. Locate the breaker cam carefully in this position so that when the slack in the distributor gears is rocked forward, the contacts will be opened by the breaker arm and when the slack in the gears is rocked backward, the contacts will just close.

Fourth — Tighten the adjustment screws securely and replace rotor and distributor head with the head properly located by the locating tongue and the hold down clips. The cylinders fire in the following order: 1-3-4-2.

3—Which will decrease power and speed, valves timed late or too early?

3—It is impossible to state the exact results from valves timed too late or too early. Generally speaking, however, the valves that are timed too early will show an increase in speed, but very poor running at low engine speed, while valves timed late will also decrease the speed and power and probably cause overheating.

4—What company or firm sells gear pullers for Buick timing gears?

4—This will be answered by special letter.

5—Can one replace old style motor generator clutch on 1918 and earlier Buicks with new silent clutch?—Quaker City Mechanic.

5—Yes.

Architectural Service

IN giving architectural advice, MOTOR AGE claims to assist its readers in their problems of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and, in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among other things, we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated and how large it is expected to be.

Number of cars on the sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop.

How much of an accessory department is anticipated.

On Pages 21 to 24 inclusive you will find the seventh article in the FLAT RATE series, including schedules for rear axle operations.

Special Fit of Wrist Pin Needed With Aluminum Pistons

Q—We are having some trouble with the new Willys-Knight cars which have been driven from 500 to 3,000 miles. The trouble is knock in the engines, which we are unable to locate. When driving the car along level ground at a speed of 20 m.p.h. the engine begins to knock. Changing the spark has no effect on the knock. All at once the knock stops and we find this knock goes and comes. Have examined all bearings and installed new junk rings but doesn't do any good. Have changed the timing of valves and ignition but it still has the same knock. We are using oil recommended by the Willys-Overland Company. There is also rattle in the clutch when we press the clutch to change gears. Any information will be appreciated.—Texas Reader.

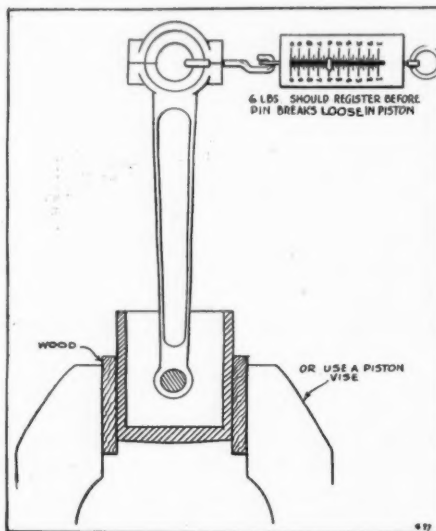
The information you have given us regarding the knock is not complete as we would like to know whether or not you have attempted to short out the knock. You are probably aware of the fact that you can short out a main or a rod bearing and in some cases a piston pin bearing and we believe that this test is far more dependable than examining the bearings for tightness as you have done.

We have been informed by the local Willys-Knight service organization that a knock in the piston pin is sometimes encountered due to too loose an initial fit in the pistons. It seems that the tendency in many repair shops is to fit the piston pin into the aluminum piston, which is being used at the present time, with the same degree of clearance or looseness as would be given a cast iron piston. To get best results the piston pin should be fitted a little tighter in an aluminum piston than in the cast iron and the Overland service station recommendation is that it be fitted so that it will require 6 pounds pull to break it loose.

When making this test for tightness it is advisable to have the pistons clamped in a piston vise or held firmly onto the bench by hand. The illustration shows the method of making the test. A decrease in the clearance between piston pin and piston on the aluminum alloy pistons is necessary because of the fact that when the piston reaches operating temperature of the engine it will expand considerably, especially at the piston pin holes and, if the pin is fitted to what would be considered the proper clearance for cast iron when cold, it would be probably .002 to .003 loose when heated to normal temperature.

The rattle in the clutch when the pedal is depressed for shifting is generally caused by looseness of the clutch driven plates on the disc pins. If you will examine the Willys clutch you will notice that there are three studs acting as guide pins on the clutch driving member. There are corresponding holes in the discs and, if there is any appreciable elongation of these holes that ride over the disc studs or pins, there will be a rattle when the clutch pedal is depressed.

The remedy is to disassemble the clutch andpeen the holes in place so as to reduce the clearance and allow just a semi-sliding fit, that is, with approximately .002 clearance between the pins and holes. If the customer does not wish to have the clutch removed for this work it is possible to effect at



least a temporary repair by giving the drive pins a coat of shellac, which will build up on the pins slightly and take up some of the play in the disc holes. The peening method, however, is recommended where a permanent repair is desired.

TIMING THE IGNITION ON A WILLYS-SAINTE CLAIRE

Q—I have a customer with a Willys Sainte Claire eight-cylinder car, it is out of synchronism. The right block is very late in relation to the left block, the breaker points are set at the same gap, but I cannot find any marks on the flywheel except opening and closing of the valves. Explain how to synchronize it. It is a 1922 model, I believe, and the engine number is 2383.

1—Strictly speaking there is no synchronizing required on the ignition system on the Willys Sainte Claire engine. The base plate that carries the interrupter arm is not moveable and, if you set the right arm, viewed from the rear, so that it is timed correctly for the right bank of cylinders, it will also automatically be correctly timed for the left bank.

To Time The Ignition.

First, remove the small cover over the inspection hole in the flywheel bell housing. Then, with some one turning the engine slowly, stop when the mark "top center No. 1" comes to the center of this hole. The next mark will be "exhaust close No. 1." With the space between these two marks directly crossing the center of this hole, you have the point where the ignition interrupter points should be set.

Place the control on the steering wheel at full retard position. Loosen the cam on the interrupter shaft and move it so that both sets of points are fully open. Then adjust the opening of the points with the Delco gage which comes as part of the tool kit. This distance should be

.015 of an inch, in case you do not have the Delco gage handy. Be sure that both sets of points have the same opening, then tighten the cam slightly. Then place the rotor on top of the cam and turn the cam until one of the rotor contacts is directly under the terminal marked No. 1 on the Bakelit housing.

The final tightening of the cam should be such that when the back lash in the gears is rocked forward the points should be opened and when rocked backward against the backlash, the points should be just closed. When you have found this point, tighten the cam permanently and the ignition is set permanently.

It is probable that the valve timing is not in synchronism and this accounts for your statement that the right bank seems to be out of time relative to the left bank. If this is true, it will be necessary to time the valve before setting the ignition timing, because of the fact that the drive to the ignition is dependent on the valve drive also, and if the valves are out of time, we would advise that you set them before setting the interrupter as outlined in the previous paragraph.

Timing the Valves.

The Willys Sainte Claire engine has cylinders set at an angle of 60 degs. The firing order and the arrangement of the number of the cylinders is shown on the top of the distributor cover, No. 1 cylinder is at the right at front and No. 8 the last cylinder on the left bank at the rear. The firing order is 1-8-3-6-4-5-2-7. In other words, the engine fires like two four-cylinder engines having a firing order of 1-3-4-2 firing on the right bank first and then alternating to the left bank.

First remove the end plate on the camshaft housing. Then proceed as follows: Time the right block first. To do this, proceed as on timing the ignition by turning the crank slowly until the mark "top center 1" just passes the hole and the mark "exhaust valve close No. 1" appears at the center of the hole. At this point you can disconnect the gear and vertical shaft on the valve drive to the right bank and set the camshaft so the exhaust valve has just closed. Be sure that the proper clearance has been previously set between the cams and the discs on top of the valve stems.

There is an Oldham coupling in each of the vertical valve drive shafts and in addition to this the bevel gears that drive the shaft proper are held on by bolts and between the top bevel gear of the vertical drive shaft and the bottom gear is this coupling something similar to the conventional magneto coupling, which is adjustable to very close limits.

In case you do not get the proper setting at the gear at the end of the camshaft, it would be well to drop the vertical shaft housing and charge the coupling referred to. With this done, you have completed the timing of the right block.

As the angle of the cylinders is 60 degs. it will be necessary again to turn

(Continued on next page)

(Continued from preceding page)

the crank slowly by hand until the marks "exhaust close No. 8 appears. No. 8 exhaust is on the rear cylinder of the left bank, viewed from the rear, and you can time this valve in exactly the same manner as you did the No. 1 exhaust on the right bank. In every case, in timing both banks, always set the valves with the backlash rocked forward and then rocked backward, getting the camshaft in the position where the valve just closes when the backlash is moved in the direction of rotation and just partially open when the backlash is moved in the opposite direction.

2—I have another car here that I am unable to secure any results from. This car is a Lincoln which has been out about one year. It keeps burning out the right headlight, the owner comes to the garage about once a week with the right headlight burned and it is run nearly every night. I cannot find any loose connections anywhere. The bulbs are single intact, 6-8 volt 32 c.p. What would you suggest to do with this car?—Sam Shankle, Long Beach, Calif.

2—The only real way to run down trouble of this nature where a lamp burns out is to use a voltmeter. In general, a poor connection between the generator and battery will cause high voltage which may produce this result, and if one light continues to burn out, it may be a coincidence rather than something wrong in that particular light.

If the car is run a great deal it may be that the battery is continually kept in a fully charged or overcharged condition and it is also possible that the battery is occasionally allowed to become somewhat dry. Test with a voltmeter should be made with the engine running and the generator charging the battery. If the battery voltage is about 7.5 under these circumstances it shows that the battery is fully charged.

If the battery voltage is down at 6 volts or about 6.5 volts it shows that the battery is not highly charged and any trouble due to burning out lights would probably occur in poor connections. However, we do not mean that such connections are so loose that you can find them by moving the wires around. Only a voltmeter can be depended upon to really find such loose connections.

The first test should be made at the battery with the engine running and generator charging. Then test from the live or insulated battery terminal to the frame of the car, then from one ammeter terminal to the frame of the car and then from the other ammeter terminal. Then make test on all of the switch connections at the back of the ignition and lighting switch.

You may find a natural difference in voltage of about .1 volt from the motor generator up to the ammeter and another difference of about .1 volt across the ammeter but if you suddenly find a large change in voltage, as from 6 to 7 volts across the ammeter, you can know that you have found the cause of the trouble. The No. 3 connection on the back of the lighting switch is the terminal at which the headlamp wires are connected, and

this voltage should not be more than .2 or .3 volts greater than the battery voltage while the motor generator is running.

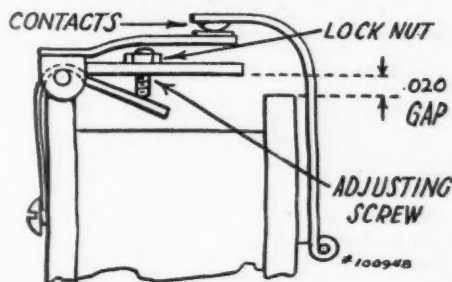
ORDINARY CUTOUT WILL NOT DO TO REPLACE A REGULATOR

Q—Would it be possible to remove the Thermostat and circuit breaker from the Remy Generator used on 1917 Biltwell Velle model 28, and connect a common circuit breaker like on Ford generator? If this can be done tell how. The generator charges too much and does not cut-out at high speed. This thermostat or circuit breaker is combined on a single unit.

1—The generator in question uses a voltage regulator for current regulation. The operation of this regulator depends on the action of a pair of vibrating contacts. The adjustment is shown in the illustration. To decrease the charging rate it is necessary to unsolder the lock nut so that the adjusting screw may be turned. The screw should be turned up, in other words in a counterclockwise or left hand direction, until the necessary charging rate is obtained. This should be 10 to 12 amperes maximum.

The lock nut should then be tightened and the output again checked, if the output is still satisfactory the nut should again be soldered to prevent its coming loose. What you have mistaken for a thermostatic control is a resistance placed across the regulator points to prevent arcing while they are vibrating.

It is also impossible to replace this Remy current regulator with the Ford cutout. If it is impossible to secure an adjustment on the Remy regulator or have it repaired replace it only with a regulator of identical model and make.



2—What is the timing of the valves on model 6-30 1919 Chalmers? This car has chain driven timing gears.—R. L. Wilhelm, Athol, S. Dak.

2—On the Chalmers 1919 6-30 model the exhaust valve closes 10 degs. after upper dead center. The intake opens at top dead center, which means that the inlet has a 10 degree overlap or lead on the exhaust valve. The recommended valve tappet clearance on intake and exhaust is .004. On piston travel 10 degs. or the point at which the exhaust valve should be just closed will be between 1/32 and 1/64 of an inch.

THE KEY, THE OWNER AND THE GARAGE AGAIN

In MOTOR AGE of September 13, page 47, there was printed a legal opinion concerning the liability of a garage-keeper in case of fire where the owner of the car previously has declined to surrender his key.

P. J. Martin, attorney for the Inter-

Insurance Exchange of the Illinois Automobile Club, agrees that, where the owner of the car refuses to leave his key with the garagekeeper, unless the contract of insurance makes a provision for this particular contingency, the insurance company cannot successfully deny liability in the event of a loss through fire, and supplements his opinion with the statement that it is not customary to incorporate such a condition in the contract of insurance.

The usual custom and so-called standard contract of insurance protects the owner of the automobile against loss by fire through any source whatever, and this is interpreted to mean any damage caused to the automobile through a blaze in which the assured is in no way involved or where the loss does not occur through his connivance.

GEAR RATIOS ON VARIOUS CARS

Q—Have you ever, at any time, published the gear set ratio of cars in the 2nd, low and reverse speeds? I have your magazine for over four years with the exception of three months and if this was ever published tell me when.—Clyde C. Henderson, Portland, Oreg.

Maintenance data tables giving transmission, and rear axle ratios of passenger cars was published April 5, 1923, September 9, 1920. Considerable gear ratio data concerning the transmission and rear axle ratios on trucks was printed November 11, 1920.

RELATION OF VALVE DIAMETER TO POWER

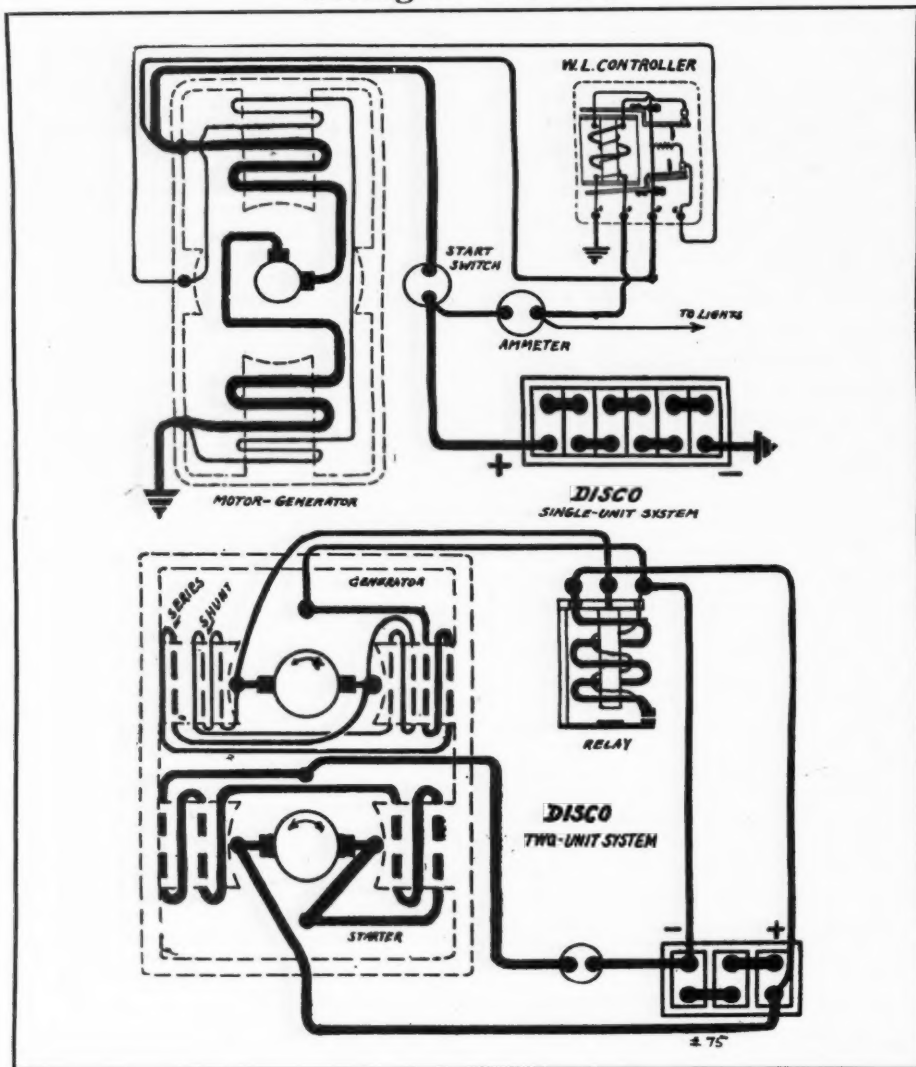
Q—Would increasing the valve diameter 1/4 in. give any increase in power and speed? Would this mean changing carburetor size? The engine I have reference to is a 1910 S.G.V. bore 3 3/4, stroke 4 3/4, with a valve diameter of 1-11/16 in. Approximately how much increase in power, if any, would I get by increasing this valve size to 1-13/16 in.?—L. Ladd, Care of Vendale Garage, Inc., Brookline, Mass.

It is impossible to prophesy the power that will be gained by the installation of larger valves. At any rate, to get the fullest advantage from the change in valve size, it probably will be necessary to install a different carburetor, and with this in mind we would suggest that you communicate with any of the carburetor companies who build equipment for every type of engine.

There are, of course, service stations of the popular carburetor manufacturers in your city, and they will be able to advise you as to the best and most efficient equipment as regard the internal specifications. If we remember correctly the S.G.V. is an unusually high compression engine, and we believe that, even though you install larger valves, it will be to your advantage to install some sort of a hot-spot on the inlet manifold.

As a matter of fact, it probably will be found that if you secure a good hot-spot that the power will be increased very materially without the addition of larger valves. A change in carburetion and the addition of a hot-spot should be the first changes contemplated, after which, if the power secured is not satisfactory, you might try the larger valves.

Wiring of Krit Car



Q—Send me wiring diagram for a Krit 1917 model.—E. Underbyer, Chicago, Ill.

The Krit car was not produced during the year 1917, as the Krit factory dis-

continued manufacture in 1915. We are showing a diagram of the last model produced.

SYSTEMATIC TESTS NEEDED ON THIS CAR

Q—Help me out on trouble we are having with a 22-45 Buick. When cold, the engine runs fine. When warmed up, often driving 20 or 30 miles, the engine will not take the gas. It has no power or pickup. Pull throttle wide open and best you can get is 30 m.p.h. Turn choke to hot and she will pickup but knock. Does not seem to miss, but when acting this way will backfire or pop in carburetor. Then runs fine for 3 or 4 miles, then seems to tighten up again.

The following has been done without helping same: Carburetor adjusted at every Buick service station from Columbus, Ohio, to Buffalo, N. Y. New spring in air valve, tank, vacuum and carburetor taken off and cleaned out, gas line blown out, valves set at .010, contact points filed, valves ground and carbon taken out. The coil has not been tested, not knowing how to test. Could coil cause this trouble? This car has always acted this way, even from the first 500 miles.—Geo. Tiffany, Rotary Club, Xenia, Ohio.

There are two probable causes of the trouble you are experiencing. The first step to eliminate trouble would be to test the ignition system. Regarding this, we

would advise that you take the car to an authorized Delco station.

The test in question is accomplished by removing one at a time the high tension wires from the spark plugs while the engine is running and at the time when the missing or erratic running is occurring. With No. 1 wire removed from the plug and held approximately 3/16 of an inch away from the cylinder block or a ground portion of the car, note whether the spark jumps regularly from the end of the wire to this ground.

Make a test for about 30 or 40 seconds counting the sparks to see that each one occurs at about the proper interval. If the No. 1 wire tests O.K. this way, go to the next one, testing all six in order. It is possible that the coil itself is defective and shows up only when heated, or that the points contain impurities in the metal which will cause high resistance and high arcing, which will prevent the proper functioning of the interrupter.

In case the spark, as previously mentioned, does not jump regularly and

misses a shot now and then, trace that particular wire to its point of fastening on the distributor cover. If no cracks appear and there is no conducting material on the raceway or the distributor rotor, it would be well to try a new coil or a coil known to be in good shape. However, as outlined, we would suggest that you have a Delco or authorized electric service station make this test.

The second possibility is trouble in the fuel system. Among the possibilities that may occur is that the fuel line from the bottom of the vacuum tank to the carburetor is placed too close to the exhaust pipe, causing boiling and consequent air pockets or air locks in the line to the carburetor. This same trouble also can occur in the supply line from the gasoline tank to the vacuum tank. The trouble outlined previously is possible, although not usually probable, judging from the layout of the Buick fuel system.

To determine definitely whether trouble is caused by the vacuum tank we would suggest that you remove entirely the vacuum tank upper tank assembly carrying the float and atmospheric valve mechanism. With the cover and upper tank removed, fill the vacuum tank itself with gasoline and operate the engine as a straight gravity system. If the engine operates properly with this arrangement, it is conclusive proof that the trouble is in the vacuum tank proper or in the vacuum line from the gasoline tank.

UNSUITABLE SPARK PLUGS WILL CAUSE TROUBLE WITH HIGH COMPRESSION ENGINE

Q—Will you please give me correct valve and ignition timing on a model 4-75 Roamer? Everything indicates that this is a 1920 machine. The engine is a Duesenberg horizontal valve type. This engine is a 4-in. bore. As yet I have not been able to get above 45 m.p.h. out of the machine. The present valve timing checks perfectly with the flywheel markings. The ignition is supplied by Bosch magneto, spark occurs approximately top center retard.—J. C. Bernard, Cerrillos, N. M.

If you have followed the marks on the flywheel to check the valve timing, there is little doubt but what the valve timing is correct. According to specifications supplied by the Revere Company, who also use the Duesenberg engine, the exhaust valve should close 11 degs. after upper dead center which on the average size and length of connecting rod will be equivalent to about 1/32 of an inch past center on piston travel. The spark timing of full retard at top dead center is correct.

The Duesenberg engine is considered a high compression engine and it is possible that, if you are using plugs that are not suitable to the engine, you are having considerable pre-ignition. Would suggest, therefore, that you try a new set of plugs, even though the plugs you have at present installed appeared to be in good shape. Name of plug often used in this engine will be forwarded to you by letter.

Tests for Leaks in Pressure Fuel System

Q—I have been a reader of your magazine for some eight or ten years and would like to ask a few questions in regard to the air pressure system on a Stutz 1921 model. We have been troubled with our car stopping on the road. We lay the trouble to an insufficient amount of pressure in the gas tank. We have looked over all connections and so far have been unable to increase the pressure. In addition we would also appreciate if you would advise us where to find and how to adjust the release valve, as we would like to carry two pounds of pressure.

The first step in tracing out this trouble would be to determine whether or not the engine driven pump is delivering 2 pounds or more air pressure. Just behind the rear cylinder and against the crankcase you will note the engine driven air pump. On the outlet side of this pump there is a "T" fitting, one branch going to the gasoline tank, the other one to the air pressure gage. If you will remove the gasoline tank pipe from this fitting and close the fitting with a solid nut or plug or some other device you can start the engine and note whether the pump shows 2 pounds pressure on the gage.

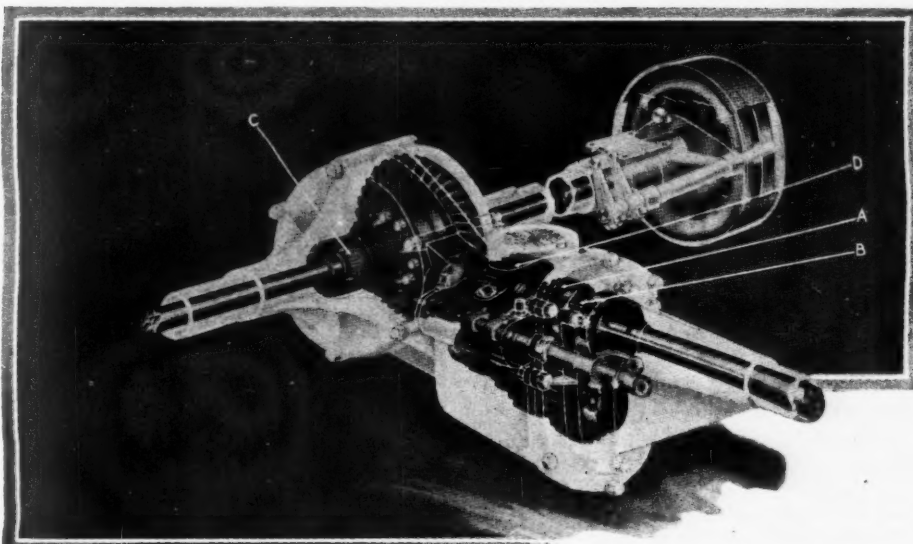
If the engine pump shows this pressure it indicates that the trouble is in the lines or in the gasoline tank. At the same time, while the gasoline line to the "T" is disconnected, it might be well to test the hand pump in the same manner. Providing both hand and engine pump show pressure, hook all the connections back onto the "T" making sure that they are air tight, which you can do by squirting a little oil around the compression couplings while the engine is pumping pressure.

To make this test it will be necessary to connect a gravity tank to the carbureter.

If, when all connections are hooked up, no pressure above $1\frac{1}{2}$ or 2 pounds shows on the gage, it would be well to trace the pipe from the air pump back to the gasoline tank, testing for leaks with soap water or lubricating oil. If this pipe tests O. K. all the way to the tank the next point of testing would be the gasoline tank itself.

Regarding this tank it is sometimes found that the leak occurs in the filler spout. The frame at the rear carries a cross member about 8 in. wide which acts as a false top for the gasoline tank. This necessitates an unusually long spout to the tank and it has been found, on some of these cars, that the leak is at the point where this filler spout is soldered onto the tank. The soap water or oil method can be used, but if no leak shows up it is advisable to remove the filler cap and fill the tank completely full, that is up to the top of the filler spout itself.

It is apparent from your letter that the leak must be quite a large one and it should be detected by this test which depends entirely on the weight of the gasoline to show up the leaks. In case the gas itself does not show up the leak, the next test would be to plug the bottom tank openings and disconnect all



lines leading from the bottom of the tank and fill the tank as near as possible to the top of the filler cap, then get an old Stutz filler cap, put an air valve in it and put a pressure on the tank with the hand pump. Two to three pounds pressure should show very plainly the presence of any leak if such a thing exists in the tank.

It has been told us by the Stutz service station here that there is no pressure relief valve in the line but an adjustable check valve is placed at the engine driven air pump. This check valve is either a ball or disk type and is part of the fitting referred to in the first paragraph. It is located immediately behind the engine pump. On some models the tension of the valve on its seat is adjusted by a screw, while on others it is necessary to either decrease or increase the spring pressure by stretching or cutting off a portion of the spring.

2—We would also like to have you publish a diagram of a 1918 differential and transmission showing all adjustment or the 1918 Stutz.—V. D. Hale, c/o Service Garage, San Gabriel, Calif.

2—A phantom view of the Stutz transmission rear axle assembly is shown. The rear axle differential ring gear is provided with an adjustment in relation to the pinion gear consisting of a threaded collar C shown in illustration on each side of the differential case. This adjustment is made accessible by removing the cap and taking out two cap screws on each side of the differential support plate. Each hole in the adjusting collar "C" moves the differential .001 of an inch.

The usual setting of the differential is as follows: unscrew the adjusting collar C on the right side and move the adjusting collar on the ring gear or left side up until it is tight. Then back off the adjusting collar on the ring gear side about 7 holes and tighten the collar C. Repairs on the rear system, with exception of adjustment to the ring gear back and forth in the axle, must be accompanied by the addition or replacement of parts.

There is no instant adjustment on the pinion to move it in or out of mesh with

the ring gear but, if it is found that the pinion meshes too deeply or not deep enough into the ring gear, it will be necessary to remove the transmission pinion shaft and insert or remove one or more steel washers behind the pinion radial and thrust bearing. The washers which are used to adjust this distance can be secured from any authorized Stutz dealer.

REPLACING FLYWHEEL ON 1921 LIBERTY

Q—Want to replace the flywheel on a Liberty Six, 1921, triple head, engine with one that has a starter gear band. The teeth on the old flywheel are stripped. Can you give me the best and quickest method to do the job? How is the flywheel fastened on shaft? Is it possible to replace it by taking the transmission and clutch down alone, or is it necessary to take the crankcase down? Anything you can tell me in regard to the above will be appreciated.—W. G. Stucke, Beardstown, Ill.

The first step is to disconnect the rear universal joint to such an extent that it will allow dropping of the drive shaft complete. Then remove the 8 bolts on the bell housing, remove pedal assembly complete; this, of course, includes removing all brake rods. Before you pull the entire clutch and transmission housing, it is advisable to release clutch. This can be done when the clutch pedal is out, but preferably before you have removed it.

Releasing the clutch is accomplished as follows: Depress the clutch pedal or move the clutch throwout bearing and insert a wooden block, $1\frac{1}{2}$ in. high by 4 in. long, between the cover and the throwout yoke. With the clutch spring tension nut released, it will enable you to remove the clutch plate screws which retain the clutch mechanism to the flywheel. You can then remove the entire assembly which will leave the flywheel retaining bolts free while removing.

The flywheel is held onto the end of the crankshaft by the conventional flange method using four or six bolts. Be sure to mark flywheel and clutch housing plate so that it will be assembled in same position.

BOOSTING ACCESSORY SALES

MANY new and interesting announcements of accessories are scheduled for the coming weeks. Show time always brings out new things and this year will not be an exception. Many of the accessories announced during 1923 and previous years have already found a good market and many more are daily slipping into oblivion. Accessory sales have increased to a very high figure during this year and there is no indication that there will be any stop.

Automobile dealers who heretofore considered accessories as poor sellers have found that with a little attention, they are real money makers, not mere accommodations. Many dealers who had believed accessories "space takers" are now devoting big show cases to their sale because they have had demonstrated to them that it takes but little effort to sell accessories that have a reason for being.

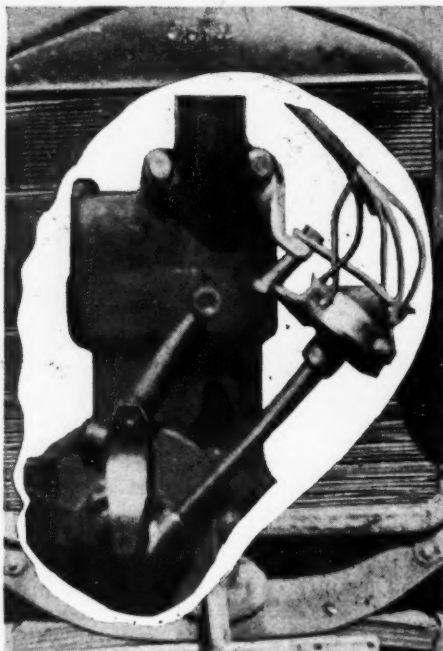
Exclusive tire dealers of a year ago, now have stocked accessories and added a battery to their tire line. One has even installed a battery repair shop and is making money. Another merchant who had developed a fine business in washing and polishing and who sold two makes of tires, recently added a complete line of accessories and a battery with the result that he now is able to use his entire building where before he rented one show room to a car dealer.

These facts prove that there is a big market for accessories which any dealer can cultivate and reap big returns from. Perhaps there is some space in your establishment, in full view of customers entering and leaving, that could be turned over to the profitable sale of accessories. One thing necessary to accessory sales, however, is cleanliness of display and attractiveness.

Trying to crowd everything in the store into a 15 foot window is poor, very poor merchandising. Better display one thing well than everything poorly. No window or show case can be attractive when it is crowded, because crowding breeds confusion and when a man sees a lot of things that he thinks he needs, he usually winds up by not buying any.

The American Grinder Mfg. Co., Milwaukee, Wis., has announced individual car and truck tool sets, containing tools designed especially for the various makes of cars and trucks. These sets contain the tools which the owner will need and of course, have various prices depending upon the car and the number of tools. At the same time this announcement was made by the American Grinder company, service sets were put on the market by them. These service sets contain tools for use on various makes of cars and trucks and include every tool which the mechanic will need.

Frasier-Marsh, 347 Naugatuck avenue, Devon, Conn., have brought out the F & M non-corroding, self-locking stor-



Fasco Ford timer

age battery terminal, the feature of which is the quickness with which the battery can be connected and disconnected. There are no nuts, bolts, screws or wedges.

An improvement is announced in the Ford Tiltlok wheel, the product of the Disco Electric Mfg. Co., Detroit, Mich., in that installation has been simplified by a new method. The regular Ford wheel is removed and the Tiltlok placed on the shaft, tightening main shaft nut and snapping top cap into place.

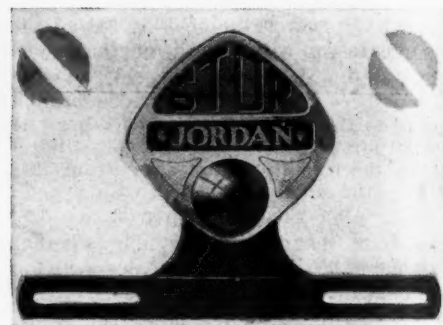
Stover Monogram Signal is the product of the Stover Signal Engineering Co., Racine, Wis. The cut illustrates the Stover signal showing the combination stop signal, tail lamp and license bracket. The name plate of the car is illuminated at night and any car name can be had with the signal.

A change in policy on Boyce Moto-Meters is announced in which new prices are announced on the Aristocrat models for Chevrolet, Star, Maxwell and Gray which use the name plates of these cars. All sell at \$7.50 and are made at the Moto-Meter Co.'s plants at Long Island City, New York.

Misener's gravity sediment extractor is screwed in the bottom of the Ford car in place of the regular drain plug. It has a ball check which is normally held open so that the oil can run into the cup of the device. When the cup is removed the ball check closes, holding the remaining oil in the crankcase but allowing the cup to be removed with its heavier sediment which has dropped into the cup over night. Misener & Misener, 312 E. Genesee street, Syracuse, N. Y., are the makers of this accessory, which sells at \$4.



Misener's gravity sediment extractor



Stover monogram signal

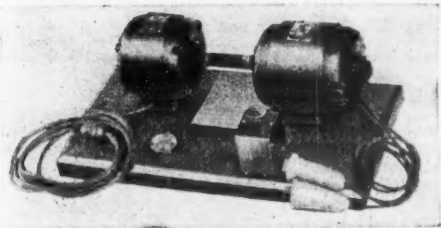
Perfect Circle Oil-Regulating Piston Rings are made by the Indiana Piston Ring Co., Hagerstown, Ind. By a simple principle, the Perfect Circle ring carries the right amount of oil to the cylinder wall, draining excess oil back into the crankcase by slots in the ring and through holes drilled in the ring groove behind the ring.

A timer for Fords in which the principle of a knife switch contact is used between the roller and contact points in the shell has been brought out under the name Fasco. In addition to this feature the timer is furnished with an elevating device, the shaft of which is driven by helical gears, the driving gear being attached to the end of the camshaft. The timer is securely held at the top by an anchor piece which attaches to the right top water connection cap screw. A loom, containing the four spark plug wires together with a control rod for advancing and retarding the spark, also is furnished.

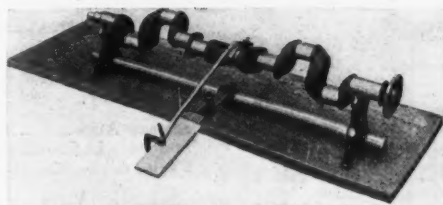
The roller is made with a V-groove around its periphery and consists of two pieces held by spring tension so that as the roller wipes over the flat contact pieces the two parts of the roller are forced apart slightly, at the same time tightly gripping the contacts with a wedging action. In this way a good contact always is assured and in addition the time of contact is considerably increased. The roller is made of Monel metal and the contacts are a special grade of imported steel to resist wear.

The Fasco timer complete sells for \$6.50 and is made by the Fasco Mfg. Co., 3700 Lake Park avenue, Chicago.

GETTING MORE OUT of the SHOP



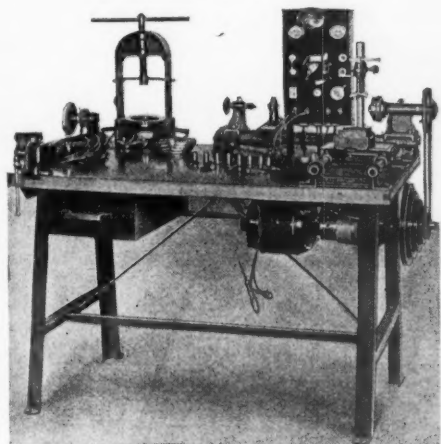
Ohio motor generator



Utility crankshaft testing machine



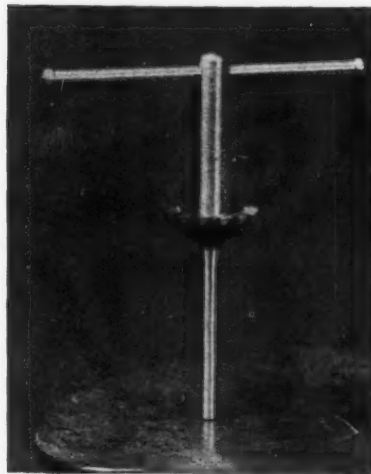
Stevens timing tester



Onan electrical repair shop assembly



Grant foot power riveter



Whitney valve reseater and valve port resurfacers

can be wound for any D. C. voltage up to 250 and used for intermittent or continuous service, such as signal or clock systems. The motor may be A. C. or D. C. to suit the service. The Ohio Electric & Controller Co., Cleveland, O., is the maker.

The Utility Tool Works, Norfolk, Nebr., announce the Utility Crank Shaft Testing Machine, a tool designed especially for testing crank shafts for roundness, alignment and parallel. The cut shows the Utility testing a crank throw bearing for parallel which is only one of its many uses.

The Whitney Combination Valve Reseater and Valve Port Resurfacers combines two features, that of the valve reseater and valve port resurfacers, the former accomplishing accurate reseating while the latter levels that portion of the casting surrounding the valve seat, permitting a free passage of the gasses and reducing the tendency of carbon deposits at this point. The R. S. Whitney Mfg. Co., 74 Nichols street, Lewiston, Maine are the makers.

Stevens & Co., 375 Broadway, New York, has brought out the Stevens Timing Tester, a device designed to enable the mechanic to see the piston in compression stroke, dead center and at beginning of power stroke and to test the spark. It is made in two sizes, S. A. E. size at \$1.50 and half inch size at \$1.50.

David W. Onan, 43 Royalston avenue, Minneapolis, Minn., announces the Onan Electrical Repair Shop Assembly for \$290. This Assembly includes the Onan testing device, with all fittings for driving and testing every make and model of generator, starter and magneto; the Onan test panel, with instruments for electrical tests on coils, magneto windings, lamps, spark plugs, fuses, etc.; the Onan lathe and mica undercutter with universal chuck for turning of small parts, commutators, etc.; the Onan bearing press, with puller plates for removing standard bearings, and a grinder for dressing tools for lathe and other purposes.

All equipments mounted on hardwood bench, with ample space for bench work, has steel bench legs and steel drawer for tools and fittings. This equipment includes motor, and is complete with instructions for operating each individual unit.

All units in this assembly are furnished separate if desired. Any unit not wanted in the assembly may be deducted at the list price. Vice shown is not furnished. Any 3½-inch or 4-inch vice is suitable. Motor furnished 11 volt, 60 cycle A. C., unless other is specified.

Don't forget that your service department has much to offer in the way of Christmas gifts and that gift certificates for many service jobs are gifts that are remembered,

SIMULTANEOUS with the announcement of new accessories, comes the announcement of many new pieces of equipment for the shop. There will, undoubtedly, be the usual array of new tools of the various shows, which, like the accessories and cars will be fully detailed in MOTOR AGE. If you would keep abreast of the times and know what is new in the automotive field, you will find all of the news heralded each week in these pages.

You know how necessary to good work good equipment is and you know that the shop which uses good equipment makes money. You cannot afford to be without those things which daily are becoming more and more necessary to efficient work.

The Grant Foot Power Riveter is made by the Grant Mfg. & Machine Co., Bridgeport, Conn. The machine is designed so that it may be attached to wall or bench and the tools furnished with each machine include a number three anvil, a number four star set, a number seven roll set and number eight roll set. A number one bushing, number nine punch holder with one-eighth inch punch, number 10 punch holder with three-sixteenths inch punch, number 13 countersinking die, one-eighth inch and a number 14 countersinking die, three-sixteenths inch, are also furnished.

The Ohio Motor-Generator shown on this page was designed especially for charging any three cell radio A or automobile ignition battery. The generator

COMING MOTOR EVENTS

AUTOMOBILE SHOWS

Albuquerque, N. M.	U. S. Good Roads Assn. and Show	May 26-31
Atlanta	Southern Automobile Show	Feb. 16-24
Baltimore	Annual Automobile Show	Jan. 19-26
Boston, Mass.	Annual Automobile Show	March 8-15
Brooklyn, N. Y.	Annual Automobile Show	Jan. 19-26
Chicago	National Automobile Show	Jan. 26-Feb. 2
Chicago	Good Roads Show	Jan. 14-31
Chicago	Annual Salon, Drake Hotel	Jan. 26-Feb. 2
Cincinnati	Third Annual Accessory and Radio Show	Nov. 17-24
Cincinnati	Eighteenth Annual Automobile Show	February
Dallas, Texas	Annual Fall Show	Oct. 13-23
Dallas, Texas	Annual Automobile Show	Feb. 11-17
Danbury, Conn.	Automobile Show in Conjunction with	
Des Moines	Annual Automobile Show	Feb. 25-March 1
Kansas City, Mo.	Annual Automobile Show	Feb. 9-16
Louisville, Ky.	Automobile Show at the Jefferson County Armory	Feb. 18-23
New York	Annual Electrical and Industrial Exposition	Oct. 17-27
New York	Foreign Automotive Association Exposition	Nov. 4-10
New York	Annual Salon, Hotel Commodore	Nov. 11-17
New York	National Automobile Show	Jan. 5-12
Syracuse, N. Y.	Automobile Show	Feb. 25-March 1
Waco, Texas	Annual Automobile Show	Oct. 20-27

Washington, D. C.	Annual Fall Closed Car and Accessory Show	Oct. 20-Nov. 5
Washington, D. C.	Annual Fall Automobile Show	Oct. 28-31

FOREIGN SHOWS

Buenos Aires	Annual Automobile Exposition	Nov. 1-15
London	Motor Car Exposition	Nov. 2-10
Paris	Truck and Tractor Show at Grand Palais	Oct. 24-Nov. 2

RACES

Berkeley, Calif.		Thanksgiving
Hartford, Conn.		Oct. 27
Los Angeles		Nov. 29
Oakland, Calif.		Nov. 1

CONVENTIONS

Chicago	Exhibit and Convention of Automotive Equipment Association	Nov. 12-17
Cleveland, O.	Society of Automotive Engineers Production Meeting	October
Cleveland, O.	Thirtieth Annual Convention, National Assn. of Farm Equipment Manufacturers	Oct. 24-26
Columbus, O.	Annual Convention, Ohio Trade Assn.	Dec. 5-6
Des Moines	Iowa Automotive Merchants Assn.	Nov. 8-9
Detroit	S. A. E. Annual Meeting	Jan. 22-25
New York	National Tire Dealers' Assn. Convention	Nov. 13-15

SQUEEKS & RATTLES

The World's "Serious"
By "Kay Em" Roberts

A Horse's Revenge

"The gate admissions to the world's series amounted to over a million dollars."

There's a deep, resounding rumble that we hear from coast to coast, it's a great united grumble from the long enduring host and a hundred million throats are hoarse from shouting loud and long, like as many bleating goats—and so there must be something wrong. What's this great, uneasy revel, why is everybody sore? We're conniving with the devil as we never did before. Is the ozone that we're breathing charged with some malicious lust that within us gets to seething 'till we have to act or bust? Or is some ill natured spirit from a long forgotten age back upon the earth to queer it with a universal rage? Every day a headline greets us, "Murder Rampant—Ten Are Dead," and a stickup artist meets us with a wallop on the head. There are strikes, with much disorder, lynching mobs are running wild and some greasers near the border have purloined a wealthy child. So we ask, "What is the matter," and we answer, "I don't know"; we expend unmeasured chatter while our troubles thrive and grow. Then some guy who's been to college, with a calculating eye, who has soaked his dome in knowledge comes along and tells us why. "It's the ever rising prices that the people have to pay," is the gist of his advices that we hear from day to day. And this Solomon has backers, we are with him, one and all—yet we spend a million smackers just to see a game of ball.

Polite But Pointed

A motorist was stopped by a policeman for speeding, whereupon he became angry and called the policeman an ass. After he had paid his fine the magistrate reproved him for what he had said to the officer.

"Then I mustn't call a policeman an ass?" he asked.

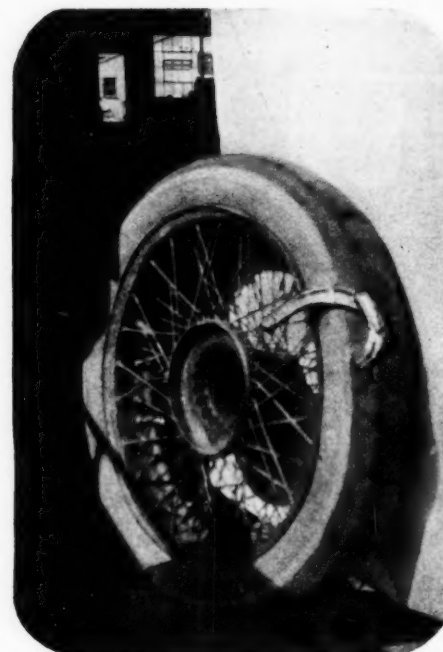
"Certainly not," said the magistrate. "You must not insult the police."

"But you wouldn't mind if I call an ass a policeman, would you?"

"Why, no, if it gives you any satisfaction," answered his worship, with a smile.

The motorist turned to the man who had arrested him. "Good-day, policeman," he said as he left the court.

—Tit-Bits.



"Horse shoes are not always lucky," says C. W. Jordan of Lincoln, Nebr., who sent this photo last week. Nay, nay.

GUY OUT IN the adjoining sticks has transmission which is not a transmission but which all but takes the place of a human driver. Other guy rises to make the remark that 'twould be better if it did take the place of some human drivers, altogether.

WHICH BRINGS US to the conclusion that there are still some pedestrians who think they have a right to live.

LEW BRICATION.

Current Motor Truck Specifications

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	Price	ENGINE		Clutch Make	Gearset Make	REAR AXLE		TIRES	
			Make & Model	Bore & Stroke			Make & Model	Final Drive	Front	Rear
Acme.....20	1-1/2		Co-N.....3 1/2x5	B&B.....3 1/2x5	Cot.....Ti-6250	WO.....34x5n	34x5n			
Acme.....30	1-1/2		Co-N.....3 1/2x5	B&B.....3 1/2x5	Cot.....Ti-6352	WO.....34x3 1/2	34x5			
Acme.....40	1-1/2		Co-JA.....3 1/2x5	B&B.....3 1/2x5	Cot.....Ti-6160	WO.....34x3 1/2	34x5			
Acme.....60	2-1/2		Co-KA.....4 1/2x5 1/2	B&B.....3 1/2x5	Cot.....Ti-6560	WO.....36x4	36x7			
Acme.....90	3-1/2		Co-LA.....4 1/2x5 1/2	B&B.....3 1/2x5	Cot.....Ti-6660	WO.....36x5	40x10			
Acme.....125	5-0 1/2		Co-B5.....4 1/2x6	B&B.....3 1/2x5	Cot.....Ti-6760	WO.....36x6	40x12			
Amer. La France	1 1/2	\$1950	Own.....4 1/2x6	Own.....Own	Own.....Own	WO.....36x5	36x5			
Amer. La France	1 1/2	5500	Own.....4 1/2x6	Own.....Own	Own.....Own	WO.....36x6	40x6			
Armleder.....21	1 1/2		Bu-GTU.....3 1/2x5 1/2	Ful.....Ful	Li-6460	WO.....34x3 1/2	34x6k			
Armleder.....HWB	2 1/2		Bu-HTU.....4 1/2x5 1/2	B-L.....B-L	Li-6560	WO.....36x4k	36x4dk			
Armleder.....HWC	2 1/2		Co-CA.....4 1/2x5 1/2	B-L.....B-L	Li-6560	WO.....36x4k	36x4dk			
Armleder.....KWB	2 1/2		Bu-YTU.....4 1/2x6	B-L.....B-L	Li-6666	WO.....36x5k	36x5dk			
Armleder.....KWC	2 1/2		Co-EA.....4 1/2x5 1/2	B-L.....B-L	Li-6666	WO.....36x5k	36x5dk			
Atlas.....25	1 1/2	1495	Bu-WTU.....3 1/2x5 1/2	B&B.....Own	Own.....Own	WO.....34x4 1/2	34x4 1/2			
Atlas.....40	1 1/2	1950	Bu-WTU.....3 1/2x5 1/2	B&B.....Own	Own.....Own	WO.....36x6n	36x6n			
Atterbury.....20R	1 1/2	2175	Co-JA.....3 1/2x5	Ful.....Ful	Li-6460	WO.....34x4k	34x6k			
Atterbury.....22C	2 1/2	3375	Co-KA.....4 1/2x5 1/2	B-L.....B-L	Li-6560	WO.....36x4k	36x4k			
Atterbury.....22D	2 1/2	4275	Co-LA.....4 1/2x5 1/2	B-L.....B-L	Li-6660	WO.....36x5	40x6d			
Atterbury.....8E-6		1975	Co-B2.....1x6	B-L.....B-L	Li-6760	WO.....36x6	40x7d			
Autocar.....21	1 1/2	2201	Own.....4 1/2x5 1/2	Own.....Own	Own.....Own	DR.....34x4	34x6			
Autocar.....27	2-3	3101	Own.....4 1/2x5 1/2	Own.....Own	Own.....Own	DR.....34x5	36x8			
Autocar.....26	4-0	4201	Own.....4 1/2x5 1/2	Own.....Own	Own.....Own	DR.....34x6	36x12			
Available.....JH	1 1/2	2450	He-O.....1x5	B-L.....B-L	Li-6460	WO.....36x3 1/2	36x5			
Available.....H	2 1/2	3160	He-CU3	1x5 1/2	B-L.....B-L	Li-6560	WO.....36x4	36x8		
Available.....H	3 1/2	4175	He-MU3	1x5 1/2	B-L.....B-L	Li-6666	WO.....36x5	40x5d		
Available.....H	5	5375	He-T3.....5x6	B-L.....B-L	Li-6760	WO.....36x6	40x12			
Avery.....1-1 1/2			Own.....3x4	Own.....Own	To-OX2	IG.....34x5n	34x5n			
Bessemer.....G1	1450		Co-N.....3 1/2x5	Ful.....Ful	To-A.....IG	35x5n	35x5n			
Bessemer.....H2	1 1/2	1995	Co-N.....3 1/2x5	B&B.....B&B	LM-7150	DR.....36x3 1/2	36x5			
Bessemer.....J2	2 1/2	2805	Co-C2.....1x5 1/2	B&B.....B-L	LM-7250	DR.....36x4	36x4d			
Bessemer.....K2	4	3495	Co-E2.....1x5 1/2	B&B.....B-L	To-E.....IG	36x5	36x10			
Bethlehem.....KN1	1385		Own.....1x5 1/2	B&B.....Det	En-1000	SB.....35x5n	35x5n			
Bethlehem.....GN2	2185		Own.....1x5 1/2	B&B.....Det	Wi-60A	DR.....34x4	34x6			
Bethlehem.....HN3	2985		Own.....1x5 1/2	Ful.....Ful	Wi-88E	DR.....36x4	36x8			
Brockway.....E2	1 1/2		Wi-SU.....1x5	B-L.....B-L	Co-5200	SB.....33x5n	33x5n			
Brockway.....S1	1 1/2		Wi-SU.....1x5	B-L.....B-L	Li-6460	WO.....36x4	36x8			
Brockway.....K	2 1/2		Co-KA.....4 1/2x5 1/2	B-L.....B-L	Li-6560	WO.....36x4	36x8			
Brockway.....R	2 1/2		Co-LA.....4 1/2x5 1/2	B-L.....B-L	Li-6666	WO.....36x5	36x5d			
Brockway.....TS	2 1/2		Co-B5.....1x6	B-L.....B-L	Li-6760	WO.....36x6	40x7d			
Buick.....23-4-SD	3 1/2	945	Own.....3 1/2x4 1/2	Own.....Own	Own.....Own	SB.....31x4n	31x4n			
Case.....TR2			Own.....1x5 1/2	TD.....Own	To-C139	IG.....36x6n	36x7n			
Chevrolet.....Supr	1 1/2	395	Own.....3 1/2x4	Own.....Own	Own.....Own	SB.....30x3 1/2	30x3 1/2			
Chevrolet.....Uml	1 1/2	550	Own.....3 1/2x4	Own.....Mun	Own.....Own	SB.....31x4n	31x4 1/2			
Clinton.....(See Schwartz)										
Clydesdale.....10	1 1/2	2350	Co-N.....3 1/2x5	B&B.....B-L	Li-5511	SB.....34x5n	34x5n			
Clydesdale.....8	1 1/2	2650	Co-KA.....4 1/2x5 1/2	B-L.....B-L	Li-6460	WO.....36x4	36x7			
Clydesdale.....6	1 1/2	3300	Co-LA.....4 1/2x5 1/2	B-L.....B-L	Li-6560	WO.....36x5	36x5d			
Clydesdale.....4	1 1/2	4200	Co-B5.....4 1/2x6	B-L.....B-L	Li-6666	WO.....36x6	40x6d			
Clydesdale.....2-6-7	4500		Co-B5.....4 1/2x6	B-L.....B-L	Li-6760	WO.....36x7	40x7d			
Commerce.....9-13-14			Co-N.....3 1/2x5	Det.....Det	Sa-D16	SB.....32x4 1/2	32x4 1/2			
Commerce.....14	1 1/2		Co-JA.....3 1/2x5	B-L.....B-L	Li-6460	WO.....36x4	36x5k			
Commerce.....25	2 1/2		Co-KA.....4 1/2x5 1/2	B-L.....B-L	Li-6560	WO.....36x4k	36x7k			
Corbitt.....S	3 1/2		HS-700.....3 1/2x5	B-L.....B-L	Sh-100	WO.....34x4 1/2	34x4 1/2			
Corbitt.....E1			Co-N.....3 1/2x5	B-L.....B-L	Sh-100	WO.....34x3 1/2	34x4k			
Corbitt.....D1 1/2			Co-JA.....3 1/2x5	B-L.....B-L	Sh-150	WO.....34x3 1/2	34x5k			
Corbitt.....C2			Co-KA.....4 1/2x5 1/2	B-L.....B-L	Sh-103	WO.....36x3 1/2	36x7k			
Corbitt.....B2 1/2			Co-KA.....4 1/2x5 1/2	B-L.....B-L	Sh-21	WO.....36x4	36x8			
Corbitt.....R3			Co-LA.....4 1/2x5 1/2	B-L.....B-L	Sh-21	WO.....36x4	36x8			
Corbitt.....A3 1/2-4			Co-LA.....4 1/2x5 1/2	B-L.....B-L	Sh-32	WO.....36x5	36x10			
Corbitt.....AA5			Co-B5.....4 1/2x6	Del.....B-L	Sh-51	WO.....36x6	40x12			
Day Elder.....AN	1 1/2		Bu-WTU.....3 1/2x5 1/2	B-L.....B-L	Li-6352	WO.....34x3 1/2	34x4			
Day Elder.....BN2			Co-JA.....3 1/2x5	B-L.....B-L	Li-6460	WO.....34x3 1/2	34x5			
Day Elder.....DN2 1/2			Co-KA.....4 1/2x5 1/2	B-L.....B-L	Li-6560	WO.....36x4	36x7			
Day Elder.....CN3			Bu-HTU.....4 1/2x5 1/2	B-L.....B-L	Li-6560	WO.....36x4	36x8			
Day Elder.....FN4			Co-LA.....4 1/2x5 1/2	B-L.....B-L	Li-6560	WO.....36x5	36x5d			
Day Elder.....EN5-6			Bu-YTU.....4 1/2x6	B-L.....B-L	Li-6760	WO.....36x5	40x6d			
Dearborn.....1600			Bu-Mu.....4 1/2x5 1/2	Ful.....Ful	Wi.....WO	35x5n	35x5n			
Dearborn.....F1 1/2		1980	Bu-WU.....4 1/2x5 1/2	Ful.....Ful	Wi.....WO	34x4 1/2	34x5			
Dearborn.....48		2390	Bu-WU.....4 1/2x5 1/2	Ful.....Ful	Wi.....WO	34x4 1/2	34x7			
Denby.....31 1/2-1 1/2		1185	Co-N.....3 1/2x5	Ful.....Ful	Cl-B300*	SB.....34x5n	34x5n			
Denby.....33		2375	Co-JA.....3 1/2x5	Ful.....Ful	Cl-ID.....IG	35x5n	35x7n			
Denby.....35		2975	Co-KA.....4 1/2x5 1/2	Ful.....Ful	Cl-2D.....IG	36x4	36x8			
Denby.....27 1/2		3695	Co-LA.....4 1/2x5 1/2	Ful.....Ful	Cl-3D.....IG	36x5	36x5d			
Denby.....2105		4295	Co-B5.....4 1/2x6	Ful.....Ful	Cl-5D.....IG	36x6	40x6d			
Denby.....2147		4945	Co-B5.....4 1/2x6	Ful.....Ful	Ra.....IG	36x6	40x14			
Dependable.....C1 1/2-2		2350	Bu-CTU.....4 1/2x5 1/2	Ful.....Ful	Wi-900J	WO.....34x5	34x8			
Dependable.....EG 2 1/2-3		2950	Bu-ETU.....4 1/2x5 1/2	Ful.....Ful	Wi-900C	WO.....36x5	36x10			
Diamond T.....03 1-1 1/2			Hi-700.....3 1/2x5 1/2	Cov.....Cov	Own.....Own	WO.....36x3 1/2	36x4			
Diamond T.....T1 1/2			Hi-700.....3 1/2x5 1/2	Cov.....Cov	Li-6460	WO.....36x3 1/2	36x5			
Diamond T.....U2 2 1/2			Hi-1400.....4 1/2x5 1/2	Cov.....Cov	Li-6560	WO.....36x4k	36x8k			
Diamond T.....K3 1/2			Hi-1500.....4 1/2x5 1/2	Cov.....Cov	Li-6666	WO.....36x5	36x5d			
Diamond T.....EL5			Hi-200.....4 1/2x5 1/2	Cov.....Cov	Li-6760	WO.....36x6	40x6d			
Diamond T.....S5			Co-B5.....4 1/2x6	B-L.....B-L	Li-6760	WO.....36x6	40x6d			
Dodge Brothers.....34		730	Own.....3 1/2x4 1/2	Own.....Own	Own.....Own	SB.....32x4n	32x4n			
Dorris.....K2 1		2490	Own.....4 1/2x5 1/2	Own.....War	Li-5512	IG.....33x5n	33x5n			
Dorris.....K-4 1 1/2		3100	Own.....4 1/2x5 1/2	Own.....War	Li-6560	WO.....36x4	36x7			
Dorris.....K-7 3 1/2		1403	Own.....4 1/2x5 1/2	Own.....War	Li-6660	WO.....36x7	36x10			
Dort.....109	1 1/2	\$ 685b	Ly-K.....3 1/2x5	Del.....Own	Fi-105.....SB	31x4n	31x4n			
Double Dr. DFT	1 1/2	4000	Bu-ETU.....4 1/2x5 1/2	B&B.....Own	Own.....Own	WO.....36x6	36x6			
Duplex.....G1			Bu-WTU.....3 1/2x5 1/2	B-L.....B-L	Li-5511.....SB	33x5	33x5n			
Duplex.....GH 1 1/2			Bu-WTU.....3 1/2x5 1/2	Cov.....Cov	Sh-1501.....WO	35x5	36x6			
Duplex.....A2		2775	Hi-400.....4 1/2x5 1/2	Cov.....Cov	Sh-103.....WO	35x5n	38x7n			
Duplex.....AC 2 1/2-3			Hi-400.....4 1/2x5 1/2	B-L.....B-L	Vu-4.....WO	34x5	36x8			
Duplex.....E3 1/2		3500	Bu.....4 1/2x5 1/2	B-L.....B-L	Own.....IG	36x8	36x8			
F. W. D.....B3		4200	Wi-A.....4 1/2x5 1/2	H-S.....Cot	Own.....SP	36x6	36x6			
Fageol.....1 1/2		3000	Wa-CT.....3 1/2x5 1/2	B-L.....Own	Li-6461.....WO	34x3 1/2	34x6			
Fageol.....2 1/2		3900	Wa-CU.....4 1/2x5 1/2	B-L.....Own	Li-6560.....WO	34x4k	36x7			
Fageol.....4		5000	Wa-DU.....4 1/2x6 1/2	B-L.....Own	Li-6666.....WO	36x5	36x5d			
Fageol.....6		5700	Wa-DU.....4 1/2x6 1/2	B-L.....Own	Li-6760.....WO	36x6	40x6d			
Federal.....R2 1			Co-JA.....3 1/2x5	B&B.....Det	Li-6250.....WO	34x5n	33x5n			
Federal.....S2 1-2			Co-KA.....4 1/2x5 1/2	B&B.....Det	Li-6560.....WO	36x4	36x8			
Federal.....U2 2 1/2-4			Co-LA.....4 1/2x5 1/2	B&B.....War	Li-6660.....WO	36				

Current Motor Truck Specifications—Continued

(This list comprises trucks distributed on a national basis)

MAKE AND MODEL	Tons Capacity	ENGINE				REAR AXLE		TIRES		MAKE AND MODEL	Tons Capacity	ENGINE				REAR AXLE		TIRES		
		Price	Make & Model	Bore & Stroke	Clutch Make	Gearset Make	Make & Model	Final Drive	Front			Rear	Price	Make & Model	Bore & Stroke	Clutch Make	Gearset Make	Make & Model	Final Drive	Front
Maccar. L2	1 1/2		Co-K4	4 1/2x5 1/2	B-L	B-L	Ti-6460	WO.	36x4	36x6	Selden. 50B	2 1/2	Co-K4	4 1/2x5 1/2	B-L	B-L	Ti-6460	WO.	36x4k	36x7k
Maccar. HA2	2		Co-K4	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x4	36x4d	Selden. 53B	2 1/2	Co-L4	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x4k	36x7k
Maccar. H23	3		Co-L4	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x4	36x5d	Selden. 70B	3 1/2	Co-L4	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x5k	36x10k
Maccar. M34	4		Co-L4	4 1/2x5 1/2	B-L	B-L	Ti-6666	WO.	36x5	36x6d	Selden. 73	4 1/2	Co-B5	4 1/2x6	B-L	B-L	Ti-6760	WO.	36x5k	36x10k
Maccar. G5-6	5-6		Co-B2	4 1/2x6	B-L	B-L	Ti-6760	WO.	36x6	40x6d	Selden. 90A	5	Co-B5	4 1/2x6	Del.	B-L	Ti-6760	WO.	36x6k	40x12
MacDonald. O3	3-5	\$5500b	Bu-WTU	3 1/2x5 1/2	B-L	B-L	**Own.	IG.	36x6	36x10	Service. 12	3 1/2	Mi-410	3 1/2x5 1/2	Hoo.	Det.	Ti-5311	SB.	32x4 1/2	32x4 1/2
MacDonald. A7 1/2	7 1/2	8000b	Bu-YTU	4 1/2x6	B-L	B-L	**Own.	IG.	40x7	40x14	Service. 25	1 1/2	Bu-WTU	3 1/2x5 1/2	B-L	B-L	Ea-1900	SB.	34x5n	34x5n
Mack. AB1 1/2	1 1/2	3000	Own.	4x5	Own.	Own.	Own.	Ch.	36x4	36x3 1/2	Service. 33	1 1/2	Bu-GBU	4 1/2x6	B&B	B-L	Ti-6352	WO.	34x3 1/2	34x6
Mack. AB2	2	3450	Own.	4x5	Own.	Own.	Own.	DR.	36x4	36x3 1/2	Service. 42	2	Bu-EBU	4 1/2x5 1/2	B&B	B-L	Ti-6460	WO.	36x4	36x7
Mack. AB2	2	3300	Own.	4 1/2x5	Own.	Own.	Own.	Ch.	36x4	36x4d	Service. 61	3	Bu-EBU	4 1/2x5 1/2	B&B	B-L	Ti-6560	WO.	36x4	36x8
Mack. AB2	2	3750	Own.	4 1/2x5	Own.	Own.	Own.	DR.	36x4	36x4d	Service. 81	4	Bu-EBU	4 1/2x5 1/2	B&B	B-L	Ti-6666	WO.	36x5	36x10
Mack. AB2 1/2	2 1/2	3400	Own.	4 1/2x5	Own.	Own.	Own.	Ch.	36x4	36x4d	Service. 103	6	Bu-YBU	4 1/2x6	B&B	B-L	Ti-6760	WO.	36x6	40x12
Mack. AB2 1/2	2 1/2	3850	Own.	4 1/2x5	Own.	Own.	Own.	DR.	36x4	36x4d	Signal. NF	1 1/2	Co-J4	3 1/2x5	B-L	B-L	Ti-6352	WO.	34x5n	36x6
Mack. AC3 1/2	3 1/2	4950	Own.	5x6	Own.	Own.	Own.	Ch.	36x5	40x5d	Signal. H	2 1/2	Co-K4	4 1/2x5 1/2	B-L	B-L	Ti-6460	WO.	36x4k	36x7k
Mack. AC3 1/2	3 1/2	5500	Own.	5x6	Own.	Own.	Own.	Ch.	36x6	40x6d	Signal. J	3 1/2	Co-K4	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x5k	36x10k
Mack. AC3 1/2	3 1/2	5750	Own.	5x6	Own.	Own.	Own.	Ch.	36x6	40x12	Signal. M	4 1/2	Co-L4	4 1/2x5 1/2	B-L	B-L	Ti-6666	WO.	36x5	40x10
Mack. AC7 1/2	7 1/2	6000	Own.	5x6	Own.	Own.	Own.	Ch.	36x7	40x7d	Signal. R	7 1/2	Co-B5	4 1/2x6	B-L	B-L	Ti-6760	WO.	36x6	40x12
Mack. AB5	5	3400	Own.	4 1/2x5	Own.	Own.	Own.	Ch.	36x4	36x4d	Standard. 75	1 1/2	Co-N	3 1/2x5	B-L	B-L	Ti-6250	WO.	33x5n	33x5n
Mack. AC7	7	4950	Own.	5x6	Own.	Own.	Own.	Ch.	36x5	40x5d	Standard. 1 1/2	1 1/2	Co-N	3 1/2x5	B-L	B-L	Ti-6352	WO.	34x3 1/2	34x5
Mack. AC10	10	5500	Own.	5x6	Own.	Own.	Own.	Ch.	36x6	40x6d	Standard. 2 1/2	2 1/2	Co-K4	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x4	36x8
Mack. AC13	13	5750	Own.	5x6	Own.	Own.	Own.	Ch.	36x6	40x12	Standard. 3 1/2	3 1/2	Co-L4	4 1/2x5 1/2	B-L	B-L	Ti-6666	WO.	36x5	36x12
Mack. AC15	15	6000	Own.	5x6	Own.	Own.	Own.	Ch.	36x7	40x7d	Standard. 5K	5	Co-B5	4 1/2x6	B-L	B-L	Ti-6760	WO.	36x6	40x14
Mason. 11 1/2	1 1/2	1200	He.	4x5	Hoo.	War.	FL.	SB.	34x5n	34x5n	Star	1 1/2	Co-N	3 1/2x5	B-L	B-L	Ti-6250	WO.	33x5n	33x5n
Master. 11 1/2	1 1/2		Bu-WTU	3 1/2x5 1/2	Ful.	Ful.	Ti-5511	SB.	33x5n	33x5n	Sterling	1 1/2	Co-N	3 1/2x5	B-L	B-L	Ti-6352	WO.	34x3 1/2	34x5
Master. 21 1/2	2 1/2		Bu-OU	4 1/2x5 1/2	Ful.	Ful.	Ti-6460	WO.	34x4	34x6	Sterling	2 1/2	Co-K4	4 1/2x5 1/2	B-L	B-L	Ti-6560	WO.	36x4k	36x7k
Master. 41 1/2	4 1/2		Bu-ETU	4 1/2x5 1/2	Ful.	Ful.	Ti-6560	WO.	34x4	36x8	Sterling	3 1/2	Co-L4	4 1/2x5 1/2	B-L	B-L	Ti-6666	WO.	36x5	36x10
Master. 51 1/2	5 1/2		Bu-YTU	4 1/2x6	B-L	B-L	Ti-6666	WO.	36x5	10x10	Sterling	4 1/2	Co-B5	4 1/2x6	B-L	B-L	Ti-6760	WO.	36x6	40x12
Master. 61 1/2	6 1/2		Bu-YTU	4 1/2x6	B-L	B-L	Ti-6760	WO.	36x5	10x12	Sterling	5	Co-N	3 1/2x5	B-L	B-L	Ti-6760	WO.	36x6	40x14
Master. 64 1/2	6 1/2		Bu-ATU	4 1/2x6	B-L	B-L	Ti-6760	WO.	36x6	10x14	Sterling	5	Co-N	3 1/2x5	B-L	B-L	Ti-6760	WO.	36x6	40x14
Maxwell. 11 1/2	1 1/2	1095	Own.	3 1/2x5 1/2	Own.	Own.	Ti-6760	WO.	36x5n	35x5n	Stewart	16	Co-N	3 1/2x5	B-L	B-L	Ti-6760	WO.	36x6	40x14
Menominee. B1	1 1/2	1650	Wi-SU	4x5	B&B	Det.	Co-5200	SB.	35x5n	35x5n	Stewart	16	Co-N	3 1/2x5	B-L	B-L	Ti-6760	WO.	36x6	40x14
Menominee. HT1 1/2	1 1/2	2000	Wi-FAU	3 1/2x5	Ful.	Del.	Wi-800G	WO.	34x3 1/2	34x5k	Stewart	16	Co-N	3 1/2x5	B-L	B-L	Ti-6760	WO.	36x6	40x14
Menominee. H1 1/2	1 1/2	2475	Wi-FAU	4x6	Ful.	Del.	Wi-800H	WO.	36x3 1/2	36x5k	Stewart	16	Co-N	3 1/2x5	B-L	B-L	Ti-6760	WO.	36x6	40x14
Menominee. D2 1/2	2 1/2	2875	Wi-TAU	4x6	Ful.	Del.	Wi-800J	WO.	36x4	36x8	Stewart	16	Co-N	3 1/2x5	B-L	B-L	Ti-6760	WO.	36x6	40x14
Menominee. J5	5	4850	Wi-RAU	4x6	B&B	Det.	Ti-6760	WO.	36x6	40x12	Stewart	16	Co-N	3 1/2x5	B-L	B-L	Ti-6760	WO.	36x6	40x14
Moline. 10 1/2	1 1/2	1995	Own.	3 1/2x5	B&B	Det.	To-A	IG.	34x5n	36x6n	Stewart	16	Co-N	3 1/2x5	B-L	B-L	Ti-6760	WO.	36x6	40x14
Nash. 2018	1-1 1/2	1695	Own.	3 1/2x5	B&B	Det.	Cl-1D	IG.	34x4	34x5	Stewart	16	Co-N	3 1/2x5	B-L	B-L	Ti-6760	WO.	36x6	40x14
Nash. 4017F	2-2 1/2	2750	Bu-HU	4 1/2x5 1/2	B&B	Det.	Cl-1D	IG.	36x6	36x6	Stewart	16	Co-N	3 1/2x5	B-L	B-L	Ti-6760	WO.	36x6	40x14
Nash. 3018	2-2 1/2	2150	Own.	3 1/2x5	B&B	Det.	Cl-2D	IG.	34x4	34x7	Stewart	16	Co-N	3 1/2x5	B-L	B-L	Ti-6760	WO.	36x6	40x14
Nash. 5018	2 1/2	2250	Own.	3 1/2x5	B&B	Det.	Cl-2D	IG.	34x4	34x7	Stewart	16	Co-N	3 1/2x5	B-L	B-L	Ti-6760	WO.	36x6	40x14
Noble. A-75	1 1/2	1395	Bu-WTU	3 1/2x5 1/2	Ful.	Ful.	Cl-300	SB.	34x4 1/2	34x4 1/2	Stewart	16	Co-N	3 1/2x5	B-L	B-L	Ti-6760	WO.	36x6	40x14
Noble. A-21 1/2	1 1/2	1890	Bu-WTU	3 1/2x5 1/2	Ful.	Ful.	Sh-1501	WO.	34x5	34x5	Stewart	16	Co-N	3 1/2x5	B-L	B-L	Ti-6760	WO.	36x6	40x14
Noble. B-31 1/2	1 1/2	3795	Bu-CTU	3 1/2x5 1/2	Ful.	Ful.	Sh-103	WO.	36x4	36x7	Stewart	16	Co-N	3 1/2x5	B-L	B-L	Ti-6760	WO.	36x6	40x14
Noble. D-51 1/2	2 1/2	3150	Bu-ETU	4 1/2x5 1/2	Ful.	Ful.	Sh-21	WO.	36x4	36x8	Stewart	16	Co-N	3 1/2x5	B-L	B-L	Ti-6760	WO.	36x6	40x14
Noble. E-71 1/2	3 1/2	3850	Bu-YTU	4 1/2x6	Ful.	War.	Sh-30	WO.	36x5	36x10	Stewart	16	Co-N	3 1/2x5	B-L	B-L	Ti-6760	WO.	36x6	40x14
Old Reliable. B2 1/2	2 1/2	3500	Wi-FAU	4x6	Ful.	Ful.	Sh-21	WO.	34x4	36x8	Stewart	16	Co-N	3 1/2x5	B-L	B-L	Ti-6760	WO.	36x6	40x14
Old Reliable. C3 1/2	3 1/2	4250	Wi-FAU	4x6	Ful.	Ful.	Sh-31	WO.	36x5	36x12	Stewart	16	Co-N	3 1/2x5	B-L	B-L	Ti-6760	WO.	36x6	40x14
Old Reliable. D7 1/2	7 1/2	5000	Wi-RAU	4x6	Own.	Own.	Sh-51	WO.	36x6	40x12	Stewart	16	Co-N	3 1/2x5	B-L	B-L	Ti-6760	WO.	36x6	40x14
Old Reliable. K5 1/2	5 1/2	6000	Wa-P	4 1/2x6	Own.	Own.	Ch.	36x6	40x14	Stewart	16	Co-N	3 1/2x5	B-L	B-L	Ti-6760	WO.	36x6	40x14	
Oldsmobile. T1	1 1/2	1095	Own.	3 1/2x5	B&B	War.	To-OX21	IG.	35x5n	35x5n	Stewart	16	Co-N	3 1/2x5	B-L	B-L	Ti-6760	WO.	36x6	40x14
Oneida. B1 1/2	1 1/2	2825	Hi-400	4x5 1/2	Ful.	Ful.	Wi-800J	WO.	36x3 1/2	36x7	Stewart	16	Co-N	3 1/2x5	B-L	B-L	Ti-6760	WO.	36x6	40x14
Oneida. C2 1/2	2 1/2	3200	Hi-400	4x5 1/2	Ful.	Ful.	Wi-900C	WO.	36x4	36x7	Stewart	16	Co-N	3 1/2x5	B-L	B-L	Ti-6760	WO.	36x6	40x14
Oneida. D3 1/2	3 1/2	4050	Hi-200	4 4																

Current Motor Truck Specifications—Continued

(This list comprises trucks distributed on a national basis)

CANADIAN

MAKE AND MODEL	Tons Capacity	Price	ENGINE		REAR AXLE		TIRES		MAKE AND MODEL	Tons Capacity	Price	ENGINE		REAR AXLE		TIRES	
			Make & Model	Bore & Stroke	Clutch Make	Gearset Make	Make & Model	Final Drive				Make & Model	Bore & Stroke	Clutch Make	Gearset Make	Make & Model	Final Drive
Gotfredson... 20	1-1/2	\$1885	Bu-WTU	3 1/2 x 5 1/2	B-L	B-L	Ti-6250	WO.	34x5n	National... FA	1	Wa-BUX	3 1/2 x 5 1/2	B-L	B-L	Ti-6352	WO.
Gotfredson... 40	1-1/2	2300	Bu-GTU	4 1/2 x 5 1/2	B-L	B-L	Ti-6400	WO.	36x6n	National... GA	1 1/2	Wa-BUX	3 1/2 x 5 1/2	B-L	B-L	Ti-6400	WO.
Gotfredson... 50	2 1/2	3000	Bu-EU	4 1/2 x 5 1/2	B-L	B-L	Ti-6500	WO.	36x8	National... HD	2 1/2	Wa-CU	4 1/2 x 5 1/2	H-S	B-L	Ti-6500	WO.
Gotfredson... 80	4	3975	Bu-YTU	4 1/2 x 6	B-L	B-L	Ti-6600	WO.	36x12	National... NB	3 1/2	Wa-DU	4 1/2 x 6 1/2	H-S	B-L	Ti-6600	WO.
Gotfredson... 100	5	4800	Bu-BTU	5 1/2 x 6 1/2	B-L	B-L	Ti-6700	WO.	36x6	National... OA	5	Wa-EU	5 1/2 x 6 1/2	H-S	B-L	Ti-6700	WO.
Mapleleaf... 1 1/2	1 1/2	3000	Hi-300	3 1/2 x 5 1/2	Ful.	Ful.	Sh-1501	WO.	34x5n	Veteran... M	1 1/2	Bu-CTU	3 1/2 x 5 1/2	B&B	Cot.	Sh-1501	WO.
Mapleleaf... AA	2	3600	Hi-400	4 1/2 x 5 1/2	Ful.	Ful.	Sh-103	WO.	36x4	Veteran... P	2	Bu-HTU	4 1/2 x 5 1/2	B&B	Cot.	Sh-103	WO.
Mapleleaf... BB	3	4050	Hi-500	4 1/2 x 5 1/2	Ful.	Ful.	Sh-21	WO.	36x4	Veteran... R	3	Bu-HTU	4 1/2 x 5 1/2	B&B	Cot.	Sh-21	WO.
Mapleleaf... CC	4	4800	Hi-200	4 1/2 x 5 1/2	Ful.	Ful.	Sh-31	WO.	36x5	Veteran... S	4	Bu-YTU	4 1/2 x 6	B&B	Cot.	Sh-31	WO.
Mapleleaf... DD	5	5625	Hi-1600	4 1/2 x 5 1/2	Ful.	Ful.	Sh-51	WO.	36x6								

Current Tractor Specifications

MAKE & MODEL			Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plovs	Price	ENGINE			Weight (Lbs.)	Traction Members, Dimension, Diameter & Face (Ins.)	MAKE & MODEL			Drawbar-Pulley Rating	Recommended No. of 14 Ins. Plovs	Price	ENGINE			Weight (Lbs.)	Traction Members, Dimension, Diameter & Face (Ins.)				
Make	No. of Cyls. Bore & Stroke	Weight (Lbs.)				Make	No. of Cyls. Bore & Stroke				Make	No. of Cyls. Bore & Stroke				Make	No. of Cyls. Bore & Stroke								
Allis-Chalmers...	6-12	1	\$295	LeR.	4-3 1/2 x 4 1/2	2500	48x 6	Gray...	DU	18-36	4	2150	Wau.	4-4 1/2 x 6 1/2	6200	†	Rumely OilPull	30-60	8-10	...	Own.	2-10x12	26700	80x30	
Allis-Chalmers...	15-25	3	1185	Mid.	4-4 1/2 x 5 1/2	4700	46x12	Gray...	EU	22-40	4	2385	Wau.	4-5 x 6 1/2	6900	†	Russell...	15-30	3-4	...	Chil.	4-5 x 6 1/2	6000	56x14	
Allis-Chalmers...	20-35	4	1885	Own.	4-4 1/2 x 6 1/2	6150	50x12	Hart-Parr...	20	20	2	...	Own.	2-5 1/2 x 6 1/2	4438	46x10	Russell...	20-40	4-5	...	Chil.	4-5 1/2 x 7	7900	60x16	
Allwork...	D	20-38	1695	Own.	4-5 x 7	6500	48x14	Hart-Parr...	30	30	3	...	Own.	2-6 1/2 x 7	5220	52x10	Russell...	30-60	8-10	...	Own.	4-8 x 10	22550	84x22	
Allwork...	C	16-30	1495	Own.	4-4 1/2 x 6	4900	48x12	Hart-Parr...	(Road)	30	3	...	Own.	2-6 1/2 x 7	7560	52x18	Shaw-Enoch (Gr.)	30-60	8-10	...	LeR.	4-3 1/2 x 4 1/2	4400	48x 8	
Aultman-Taylor...	15-30	3-4	1900	Chil.	4-5 x 6 1/2	7800	70x12	Heider...	D	9-16	2	...	Wau.	4-4 1/2 x 6 1/2	4000	54x8	Topp-Stewart...	30-45	4	...	LeR.	4-3 1/2 x 4 1/2	2900	41x9	
Aultman-Taylor...	22-45	4-6	3100	Own.	4-5 1/2 x 8	12500	70x20	Heider...	C	12-20	3	...	Wau.	4-4 1/2 x 6 1/2	4000	57x10	Toro...	6-10	2	...	LeR.	4-3 1/2 x 4 1/2	2900	41x9	
Aultman-Taylor...	30-60	8-10	4400	Own.	4-7 x 9	22500	90x24	Huber...	(Light 4)	12-25	3	985	Wau.	4-4 1/2 x 6 1/2	5000	60x10	Townsend...	10-20	2-3	...	Own.	2-6 1/2 x 7	4500	48x12	
Avery...	15-35	3-4	...	Own.	4-4 1/2 x 6 1/2	4750	50x12	Huber...	(Super 4)	15-30	3	...	Mid.	4-4 1/2 x 6 1/2	6000	60x10	Townsend...	15-30	3-4	...	Own.	2-7 x 8	6500	56x18	
Avery...	20-35	4-5	...	Own.	4-4 1/2 x 7	7500	60x16	Lauson...	S	12-25	3	...	Mid.	4-4 1/2 x 6 1/2	4200	...	Townsend...	25-50	4-8	...	Own.	2-8 1/2 x 10	11500	60x24	
Avery...	25-50	5-6	...	Own.	4-6 1/2 x 7	12500	69x20	Lauson...	T	15-30	4	...	Bea.	4-4 1/2 x 6	6200	...	Traylor...	6-12	1	...	500	LeR.	4-3 1/2 x 4 1/2	1750	38x10
Avery...	45-65	8-10	...	Own.	4-7 1/2 x 8	22000	87 1/2 x 24	Leader...	B	12-18	2	375	Own.	2-6 1/2 x 6	4800	50x12	Twin City...	12-20	3	...	1200	Own.	4-4 1/2 x 6	4550	50x12
Avery, Tr. Runner	3	Own.	4-4 x 5 1/2	5000	x 8 1/2	Leader...	N	16-32	3-4	1275	Chil.	4-5 x 6	5800	52x12	Twin City...	20-35	5	...	2750	Own.	4-7 1/2 x 8	8190	60x20
Avery, Road Racer	Own.	6-3 x 4 1/2	4600	42x 6	Leader...	GU	16-32	3-4	2150	Chil.	4-5 x 6	5800	52x12	Twin City...	10-65	8	...	4750	Own.	4-5 1/2 x 7	23700	84x24
Bates (St. Mule) H	15-25	3	...	Mid.	4-4 1/2 x 5 1/2	3600	48x10	Lincoln...	A	15-30	3	1600	Bud.	4-4 1/2 x 6	5000	40x14	Uncle Sam... C-20	12-20	2-3	...	990	Her.	4-4 x 5	3000	46x12
Bates (St. Mule) F	18-25	3	...	Mid.	4-4 1/2 x 5 1/2	4850	56x10	Little Giant...	B	16-22	4	...	Own.	4-4 1/2 x 5	5200	54x11	Uncle Sam...	20-30	3-4	...	1535	Bea.	4-4 1/2 x 6	4650	50x12
Bates (St. Mule) G	25-35	4	...	Mid.	4-4 1/2 x 6	6500	x 10	Little Giant...	A	26-35	6	...	Own.	4-5 1/2 x 6	8700	66x20	Uncle Sam... D-21	20-30	3-4	...	1485	Bea.	4-4 1/2 x 6	4600	50x12
Bates (St. Mule) 40	30-40	4	...	Mid.	4-4 1/2 x 6	8500	84x12	Lombard...	100	12-16	...	Own.	6-5 1/2 x 7	19000	x 12	Wallis...	OK	15-27	3	...	Own.	4-4 1/2 x 5 1/2	3660	48x12	
Best...	B	25-35	4	4250	Ste.	4-4 1/2 x 6 1/2	6000	64x12	London...	12-25	3	...	Mid.	4-4 1/2 x 6 1/2	48x12	Waterloo Boy...	N	12-25	3	...	Own.	2-6 1/2 x 7	5869	52x12	
Best...	30-40	4	...	Own.	4-4 1/2 x 6 1/2	8100	68x11 1/2	McCorkle-Deering	10-20	2	850	Own.	4-4 1/2 x 5	3700	42x12	Wetmore...	12-25	3	...	1185	Wau.	4-4 x 5 1/2	2900	46x10	
Best...	40-60	6	...	Own.	4-6 1/2 x 8	15580	89x20	McCorkle-Deering	15-30	3	1250	Own.	4-4 1/2 x 6	5750	50x12	Wisconsin...	16-30	3-4	...	1750	Chil.	4-5 x 6 1/2	5600	52x12	
Bryant...	Steam	15-30	3	2385	Own.	2-4 x 5	5500	52x12	Minneapolis...	12-25	3	...	Own.	4-4 1/2 x 6	6600	56x12	Wisconsin...	22-40	4-5	...	2550	Chil.	4-5 1/2 x 6	5600	52x12
Case...	12-20	3	1095	Own.	4-4 x 5	4230	42x12	Minneapolis...	17-30	3-4	...	Own.	4-4 1/2 x 7	6100	54x12	Yuba (Ball Tread)	15-25	4	...	2750	Wis.	4-4 1/2 x 6	5750	53x12	
Case...	15-27	3-4	1350	Own.	4-4 1/2 x 6	6600	52x14	Minneapolis...	22-44	4-5	...	Own.	4-6 x 7	12410	62x20	Yuba (Ball Tread)	25-40	8	...	4500	Own.	4-5 1/2 x 7	10130	48x17 1/2	
Case...	22-40	4-5	2650	Own.	4-5 1/2 x 6 1/2	10700	56x16	Minneapolis...	35-70	8-10	...	Own.	4-7 1/2 x 9	22500	85x30										
Case...	40-72	8-10	4900	Own.	4-7 x 8	21200	72x20	Moline (Un.)...	D	9-8	2-3	725	Own.	4-3 1/2 x 5	4103	52x8									
Caterpillar...	2 Ton	15	...	Own.	4-4 x 5 1/2	4000	*	Moline (Orc.)...	D	9-8	2-3	725	Own.	4-3 1/2 x 5	3893	44x8									
Caterpillar...	5 Ton	25	...	Own.	4-4 1/2 x 6	9400	*	Monarch...	C	20-30	4	3800	Bea.	4-4 1/2 x 6	8700	66x12									
Caterpillar...	10 Ton	40	...	Own.	4-6 1/2 x 7	20000	*	Monarch...	E	25-40	...	5000	Bea.	4-4 1/2 x 6	12000	67x12									
Cletrac...	F	9-16	2	845	Own.	4-3 1/2 x 4 1/2	1930	42x 5 1/2	Monarch...	D	35-60	...	6000	Bea.	6-1 1/2 x 6	15000	89x12								
Cletrac...	W	12-20	2	1345	Own.	4-4 x 5 1/2	3155	48x 8	Nichols-Shepard	20-42	4-6	2600	Own.	2-8 1/2 x 10	13500	64x20									
Eagle...	F	12-22	3	...	Own.	2-7 x 8	5850	48x12	Nichols-Shepard	25-50	6-8	3320	Own.	2-9 1/2 x 12	20500	69x28									
Eagle...	H	16-30	4	...	Own.	2-8 x 8	7100	48x12	Nichols-Shepard	35-70	8-12	4030	Own.	2-10 1/2 x 14	30000	73x32									
E-B...	AA	12-20	3	...	Own.	4-4 1/2 x 5	5450	54x12	Pioneer...	G	18-36	4	...	Own.	4-5 1/2 x 6	6500	60x18								
E-B...	Q	12-20	3	...	Own.	4-4 1/2 x 5	6500	60x12	Pioneer...	C	40-75	10	...	Own.	4-7 x 8	24000	96x24								
E-B...	16-32	4	...	Own.	4-5 1/2 x 7	9400	72x16	Rumely OilPull	12-20	3	...	Own.	2-6 x 8	6682	51x12										
Fageol...	19-12	2	1200	Lyc.	4-3 1/2 x 5	3600	42x 11 1/2	Rumely OilPull	16-30	4	...	Own.	2-7 x 8 1/2	9600	56x16										
Fordson...	18-20	2	420	Own.	4-4 x 5	2562	42x12	Rumely OilPull	20-40	6	...	Own.	2-8 x 10	12820	64x20										
Frick...	A	12-20	2	1000	Erd.	4-4 x 5	5800	60x10																	
Frick...	C	15-28	3	1600	Bea.	4-4 1/2 x 6	6730	60x12																	

GARDEN TRACTORS																	
Make	No. of Cyls. Bore & Stroke	Weight (Lbs.)	Traction Members, Dimension, Diameter & Face (Ins.)	Make	No. of Cyls. Bore & Stroke	Weight (Lbs.)	Traction Members, Dimension, Diameter & Face (Ins.)	Make	No. of Cyls. Bore & Stroke	Weight (Lbs.)	Traction Members, Dimension, Diameter & Face (Ins.)						
Aro...	F	3-6	1	\$385	Own.	1-4 1/2 x 5	1000	30x 4	Beeman...	Jr.	1 1/2-1	1	195	B&S.	1-2 1/2 x 2 1/2	2100	30x 3
Beeman...	K	1 1/2-4	1	265	Own.	1-3 1/2 x 4 1/2	550	25x 3 1/2	Beeman...	K	1 1/2-4	1	180	B&S.	1-2 1/2 x 2 1/2	190	10 x 3
Bolens...	1923	2 1/2-5	1	345	N-W.	1-1 1/2 x 4 1/2	700	28x 4	Centaur...	1923	2 1/2-5	1	395	Own.	1-3 1/2 x 3 1/2	750	...
Do-It-All...	(Jack)	2 1/2-6	1	495	Own.	1-1 1/2 x 5	1200	26x 2 1/2	Do-It-All...	(Baby)	2 1/2-6	1	495	Own.	1-1 1/2 x 5	800	32x 4
Do-It-All...	(Twins)	4-15	1	190	Own.	1-3 x 3 1/2	180	22 x 5 1/2	Kinkade...	1 1/2-3 1/2	1	190	Own.	1-3 x 3 1/2	180	22 x 5 1/2	
Motor Mactuator	1 1/2-4 1/2	1	148	Own.	1-2 3/4 x 2 1/2	110	19 1/2 x 3 1/2	N.B...	2	6	1	375	Own.	2-2 1/2 x 4	750	32 x 4	
Utilitor...	501A	2 1/2-4	1	295	Own.	1-3 1/2 x 4 1/2	750	24 1/2 x 3 1/2	Utilitor...	501A	2 1/2-4	1	340	Own.	1-3 1/2 x 4 1/2	925	24 1/2 x 3 1/2

R&S—Briggs & Stratton
Ben—Beaver
Bud—BudaCH—Climax
Her—Hercules
LeR—LeRoiLyc—Lycmox
Mid—Lycoming
N-W—New WaySte—Stearns
Wau—Waukesha
Wei—WeldleyWis—Wisconsin
†—Unless otherwise specified all traction members are of the wheel type.*—Track Type, length of ground contact surface
†—Drum Type

Current Taxicab Specifications

NAME AND MODEL	Price	Wheel Base (Ins.)	Tire Size (Ins.)	Weight (Lbs.)	ENGINE			ELECTRICAL SYSTEM		Clutch: Type and Make	Gearset Make	Univer- sal Make	REAR AXLE		
					Make and Model	No. of Cyls. Bore and Stroke	Horse Power Rating (N.A. A.C.)	Carbu- reter Make	Generator and Starter Make				Ignition Make	Type and Make	Gear Ratio
Checker.....	\$2380	117	32x4½	4100	Buda—WTU.....	4-3½x5½	22.50	Zenith.....	Westing.....	Bosch.....	m-d Fuller.....	Fuller.....	Blood.....	¾F-Columbia.....	4.87
Driggs.....	1950	108½	30x3½	2200	Ow.....	4-3½x5½	11.03	Zenith.....	Bosch.....	Bosch.....	m-d Fuller.....	Fuller.....	Spicer.....	¾F-Ow.....	4.75
Elar.....	2100	118	33x4½	3415	Lycorning—CF.....	4-3½x5	21.03	Carter.....	Delco.....	Delcoff.....	s-p Borg & B.....	Muncie.....	Peters.....	¾F-Salisbury.....	4.75
Elar.....	2450	118	33x4½	3590	Cont—8R.....	6-3½x4½	27.34	Strom.....	Delco.....	Delcoff.....	s-p Borg & B.....	Warner.....	Spicer.....	¾F-Salisbury.....	4.75
Pennant.....	2895*	115	33x4½	3895	Buda—WTU.....	4-3½x5½	22.50	Zenith.....	Westing.....	Splitdorf.....	m-d Fuller.....	Fuller.....	Blood.....	¾F-Columbia.....	4.87
Premier.....	2400	118	33x4½	3850	Buda—WTU.....	4-3½x5½	22.50	Zenith.....	Bosch.....	Bosch.....	m-d Fuller.....	Fuller.....	Blood.....	¾F-Columbia.....	4.70
Rauch & Lang.....	T	2350	112	32x4	Buda—WTU.....	4-3½x5½	22.50	Zenith.....	Dyneto.....	Bosch.....	s-p Detroit.....	Detroit.....	Spicer.....	½F-Standard.....	5.10
*Rauch & Lang.....		102	33x4½	4100	Ow.....	Electric.....		None.....	None.....	None.....	None.....	None.....	Ow.....	¾F-Ow.....	8.6
Res.....	V	2085	119	33x4½	Ow.....	4-1½x4½	27.23	Johnson.....	North.E.....	North.E.....	m-d Ow.....	Ow.....	Ow.....	¾F-Ow.....	4.70
Yellow.....	03	2340	100	33x4½	Cont—V4.....	4-3½x5	22.50	Zenith.....	†North.E.T.....	Bosch.....	m-d Brown-L.....	Brown-L.....	Spicer.....	½F-Timken.....	4.90
Yellow.....	A2	1995	100	29x4½	Cont—V7.....	4-3½x5	18.23	Zenith.....	†North.E.T.....	Bosch.....	m-d Brown-L.....	Brown-L.....	Spicer.....	½F-Timken.....	4.90

Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

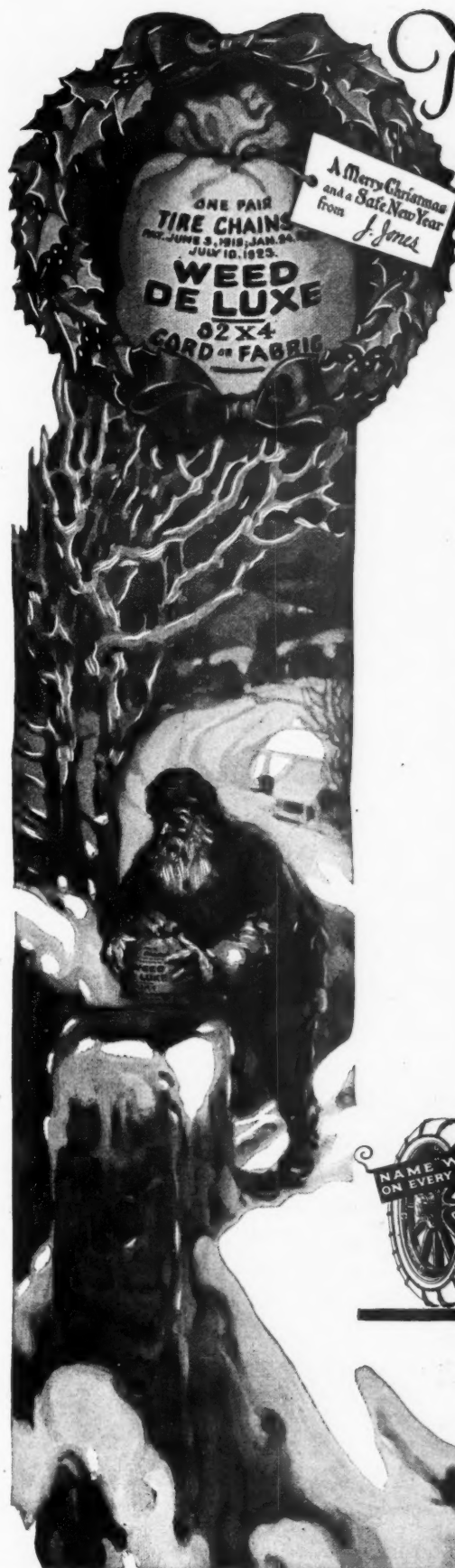
PRICES						Wheel Base (Ins.)	Tire Size (Ins.)	NAME AND MODEL	ENGINE			ELECTRICAL SYSTEM		Clutch: Type and Make	Gearset Make	Universal: Type and Make	REAR AXLE		BRAKES, Service and Emergency			
OPEN MODELS			CLOSED MODELS						Make and Model	No. of Cyls. Bore and Stroke	Horse Power Rating (N.A.A.C.)	Carburetor Make	Generator and Starter Make				Ignition Make	Type and Make		Gear Ratio	Type and Make	
2-3 Pass.	4-5 Pass.	6-7 Pass.	2-3 Pass.	4-5 Pass.	6-7 Pass.																	
\$1950c	\$1785	\$1850	\$1885c	\$2250	\$2485	127	33x4 1/2	American.....	D-66	H-S.. 11000	6-3 1/2 x 5	29.40	Strom...	G-D...	A-K...	s-p B&B.	B & B...	m Hart...	F Salis	4.50	R-L-R	
1195			1395c		1495	114	32x4	Anderson.....	41	Cont... 6 Y	6-3 1/2 x 4 1/2	23.44	Zenith...	West...	s-p B&B.	Durston...	f Univ...	1/2 F Salis	4.75	R-L-R		
1495	1495	1505	(1785b)	1995c	1995d	122	32x4	Anderson.....	Series 50	Cont... 8 R	6-3 1/2 x 4 1/2	27.34	Rayfield...	Remy...	s-p B&B.	Durston...	f Univ...	1/2 F Salis	1.02	R-L-R		
	1535					132	33x4	Anderson.....	Series 50	Cont... 8 R	6-3 1/2 x 4 1/2	27.34	Rayfield...	Remy...	s-p B&B.	Durston...	f Univ...	1/2 F Salis	4.62	R-L-R		
	2485	2485				120	32x4	Apperson.....	6	Own.....	6-3 1/2 x 4 1/2	23.44	Strom...	Remy...	s-p B&B.	Durston...	f Univ...	1/2 F Col.	5.10	R-L-R		
	1095		1325d	1495c	3385	130	33x5	Apperson.....	8-23-S	Own.....	8-3 1/2 x 5	33.80	Johnson...	Bijur...	m-d Own.	Own...	m Thie...	1/2 F Own	4.25	R-L-R		
	1595		1850d		1595	114	31x4	Auburn.....	6-43	Cont... 6 Y	6-3 1/2 x 4 1/2	23.44	Strom...	Remy...	s-p B&B.	Warner...	m Detr...	1/2 F Col.	4.60	R-L-R		
					2345	124	32x4 1/2	Auburn.....	6-63	Own.....	6-3 1/2 x 5	25.35	Strom...	Remy...	s-p B&B.	Warner...	m Thie...	1/2 F Col.	4.60	R-L-R		
	1395		1495d		1850	118	32x4	Barley.....		Cont... 6 Y	6-3 1/2 x 4 1/2	23.44	Strom...	Delco...	s-p B&B.	Fuller...	f M&E.	1/2 F Col.	5.10	R-L-R		
	935	965		800c	1395c	109	31x4	Buick.....	1924	Own.....	4-3 1/2 x 4 1/2	18.23	Marvel...	Delco...	m-d Own.	Own...	m Own...	1/2 F Own	4.66	F-L-R		
	1275	1295		1135g	1995c	120	32x4	Buick.....	1924	Own.....	6-3 1/2 x 4 1/2	27.34	Marvel...	Delco...	m-d Own.	Own...	m Own...	F Own	1.10	F-L-R		
1385g		1565	(1675a)	2235f	2285	128	33x4 1/2	Buick.....	1924	Own.....	6-3 1/2 x 4 1/2	27.34	Marvel...	Delco...	m-d Own.	Own...	m Own...	F Own	1.70	F-L-R		
2085	2085	2085	3875	3950	4250	132	33x5	Cadillac.....	V 63	Own.....	8-3 1/2 x 5 1/2	31.25	Own...	Delco...	m-d Own.	Own...	m Spicer	F Tim	5.04	F-L-R		
1750	1790		2230d	2480c	2675	122	32x4 1/2	Case.....	X	Cont... 8 R	6-3 1/2 x 4 1/2	27.34	Rayfield...	Delco...	m-d Own.	Own...	f Sneed...	1/2 F Col.	5.09	R-L-R		
	1185		1990	1950c	3325	129	33x5	Case.....	Y	Cont... 6 T	6-3 1/2 x 4 1/2	31.54	Rayfield...	Delco...	m-d Own.	Own...	f Sneed...	1/2 F Col.	4.09	R-L-R		
			1335d	1535		117	32x4	Chalmers.....	1923	Own.....	6-3 1/2 x 4 1/2	25.35	Strom...	A-L...	s-p B&B.	Warner...	m Own...	1/2 F Ad.	5.13	R-L-R		
	1595	1485	1635	1785c		122	32x4	Chalmers.....	1923	Own.....	6-3 1/2 x 4 1/2	25.35	Strom...	A-L...	s-p B&B.	Warner...	m Own...	1/2 F Ad.	5.13	R-L-R		
	490	495	395g		795	103	30x3 1/2	Chandler.....	Six	Own.....	6-3 1/2 x 5	29.40	Strom...	Bosch...	s-p B&B.	Own...	f Own...	F Own	4.45	R-L-R		
	1085	1045		(1145d)	1245	112 1/2	31x4	Chevrolet....	Superior	Own.....	4-3 1/2 x 4	21.76	Zenith...	Remy...	e Own...	Own...	m Own...	1/2 F Own	3.77	R-L-R		
				1295a	1345	115	31x4	Cleveland.....	42	Own.....	6-3 1/2 x 4 1/2	22.50	Strom...	Bosch...	s-p B&B.	Own...	m Mech...	1/2 F Own	4.90	R-L-R		
		2175	2175		2750c	3075	127 1/2	Cole.....	Master	Nort.M300	8-3 1/2 x 4 1/2	39.20	Johnson...	Delco...	m-d Nort.	Nort...	m Spicer	F Col.	4.70	R-L-R		
	1475				1925c	1995	115	Columbia....	Big Six	Cont... 8 R	6-3 1/2 x 4 1/2	27.34	Strom...	A-L...	s-p B&B.	Durston...	m Spicer	1/2 F Tim	4.75	R-L-R		
985c	985		(1195d)	1395	1495	115	31x4	Columbia....	Light Six	Cont... 6 Y	6-3 1/2 x 4 1/2	23.44	Strom...	A-L...	s-p B&B.	Durston...	m Spicer	1/2 F Tim	5.10	R-L-R		
1395p	1295		1595c	1495	2195p	1895f	116	32x4	Courier.....	Falls. 8000	6-3 1/2 x 4 1/2	33.44	Strom...	West...	A-K...	s-p B&B.	Muncie...	f Flex...	1/2 F Col.	5.10	R-L-R	
	3100	3100		4500		138	33x4 1/2	Crawford....	23-6-70	Cont... 6 T	6-3 1/2 x 5 1/2	31.54	Zenith...	West...	m-d B-L.	B-L...	m Spicer	1/2 F Tim		R-L-R		
	5900	6300		7650		142	33x5	Crawford-Dagmar	6-70	Cont... 6 T	6-3 1/2 x 5 1/2	31.54	Zenith...	West...	m-d B-L.	B-L...	m Spicer	1/2 F Tim		R-L-R		
								Cunningham...	V 4	Own.....	8-3 1/2 x 5	45.00	Strom...	Delco...	m-d Own.	Own...	f Sneed...	F Tim	4.23	R-L-R		
5000	4650	4700	4650c	6350	6450	132	33x5	Daniels.....	23-38	Own.....	8-3 1/2 x 5 1/2	39.20	Zenith...	Delco...	m-d Own.	Own...	m Spicer	F Tim	4.23	R-L-R		
	5000	5150		6000c	6600	138	33x5	Daniels.....	23-38	Own.....	8-3 1/2 x 5 1/2	39.20	Zenith...	Delco...	m-d Own.	Own...	m Spicer	F Tim	4.23	R-L-R		
1295	1295		1495c	1595	1795c	115	31x4	Davis.....	71	Cont... 7 U	6-3 1/2 x 4 1/2	23.44	Strom...	Delco...	s-p B&B.	Warner...	m M&E.	1/2 F Tim	5.10	R-L-R		
1595	1595		1895d	2095		120	32x4 1/2	Davis.....	63	Cont... 8 R	6-3 1/2 x 4 1/2	27.34	Strom...	Delco...	s-p B&B.	Warner...	m Peters	1/2 F Tim	5.15	R-L-R		
850	880		730g	1035	1250	116	32x4	Dodge Brothers		Own.....	4-3 1/2 x 4 1/2	24.03	Stewart...	N.E...	m-d Own.	Own...	m Own...	1/2 F Own	1.11	R-L-R		
	3950	3950	4150c	495c	5550	5900	136	33x5	Dorris.....	6-80	Own.....	6-4 x 5	38.40	Strom...	West...	Bosch...	m-d Own.	Warner...	m Spicer	1/2 F Tim	4.23	R-L-R
870	885		995c	1240	1350	108	31x4	Dort.....	23-18	Lyc... KB	4-3 1/2 x 5	19.60	Carter...	Bosch...	m-d Det.	Own...	m Mech...	1/2 F Fl.	4.66	R-L-R		
1010	1025		1135c	1355	1465	115	31x4	Dort.....	25-20	Falls T8000	4-3 1/2 x 5	23.44	Carter...	Bosch...	m-d Det.	Own...	m Mech...	1/2 F Fl.	4.66	R-L-R		
	6250		6500c	7500	7800	134	33x5	Duesenberg...	Straight 8	Own.....	8-2 1/2 x 5	26.45	Strom...	Delco...	s-p Own.	Own...	f Cl...	1/2 F Ad.	4.45	F-L-R		
890	890		1065d	1365	1365	109	31x4	Durant.....	A-22	Cont... Spec	4-3 1/2 x 4 1/2	24.03	Till...	A-L...	s-p Own.	Warner...	m Spicer	1/2 F Ad.	4.33	R-L-R		
	1000	1050		2250	2400	123 1/2	32x4 1/2	Durant.....	B-22	Anst... D	6-3 1/2 x 4 1/2	25.35	Rayfield...	A-L...	s-p Anst.	Warner...	m f Spi	1/2 F Tim	5.15	R-L-R		
1485	1095		1275d	1395c	1595	112	32x4	Earl.....	40	Own.....	4-3 1/2 x 5 1/2	18.91	Scoo...	A-L...	s-p B&B.	Own...	f Own...	1/2 F Own	4.87	R-L-R		
	995		1135d	1425	p1565d	112	31x4	Elcar.....	4-40	Lyc... K	4-3 1/2 x 5	21.03	Strom...	Delco...	s-p B&B.	Warner...	m Peters	1/2 F Salis	4.50	R-L-R		
	1395		1595d	1995	p2195d	118	32x4	Elcar.....	6-60	Cont... 8 R	6-3 1/2 x 4 1/2	27.34	Strom...	Delco...	s-p B&B.	Warner...	m Spicer	1/2 F Salis	4.50	R-L-R		
	1045		1145	1145		108 1/2	32x4	Essex.....		Own.....	4-3 1/2 x 5	18.23	Own...	Bosch...	m-d Own.	Own...	m Spicer	1/2 F Own	4.66	R-L-R		
1195	1195		1195	1895c	1985	120	32x4 1/2	Flint.....		Cont... Spec	6-3 1/2 x 5	27.34	Strom...	DeJon...	s-p Own.	Warner...	m Spicer	1/2 F Ad.		R-L-R		
265r	295a	230g		525	685	100	30x3 1/2	Ford.....	T	Own.....	4-3 1/2 x 4	22.50	Own...	West...	m-d Own.	Own...	m Own...	1/2 F Own	3.63	T-L-R		
2975	2975		3975	3975		132	32x4 1/2	Fox.....	Air-Cooled	Own.....	6-3 1/2 x 5	27.34	Strom...	West...	Scintilla	m-d B-L.	B-L...	m Spicer	1/2 F Tim	4.90	R-L-R	
	1950		(2760c)	2250	2285	115	32x4	Franklin.....	10	Own.....	6-3 1/2 x 4	25.35	Own...	A-K...	s-p B&B.	Own...	m Spicer	1/2 F Own	4.73	T-L-R		
	995	995	1145c	1145	1445	112	32x4	Gardner.....	Series 5	Lyc... CE	4-3 1/2 x 5	21.76	Zenith...	West...	s-p B&B.	Mech...	m Peters	1/2 F Fl.	4.80	R-L-R		
490	520		625d	885	835	100	30x3 1/2	Gray.....		Own.....	4-3 1/2 x 4	21.03	Scoo...	West...	s-p Own.	Own...	m Mech...	1/2 F Tim	3.90	T-L-R		
2250	2250		2850f	2600		120	32x4 1/2	H.C.S.....	Series 4	Weid...	4-3 1/2 x 5 1/2	22.50	Strom...	Delco...	m-d B-L.	B-L...	m Spicer	1/2 F Own	4.63	R-L-R		
	2650					126	32x4 1/2	H.C.S.....	Series 6	Midw...	6-3 1/2 x 5	29.40	Strom...	Delco...	s-p B&B.	B-L...	m Spicer	1/2 F Own	4.30	R-L-R		
1395	1395		1495c	2195		121	32x4	Hanson.....	66	Cont... 8 R	6-3 1/2 x 4 1/2	27.34	Marvel...	Delco...	s-p B&B.	G-L...	m Univ...	F Tim	4.66	R-L-R		
	1345	1345c		1950	1950	115	32.4	Hatfield.....	A-42	H-S.. 7000	4-3 1/2 x 5	19.60	Zenith...	Dyneto	s-p B&B.	G-L...	m Spicer	1/2 F Col.	4.66	R-L-R		
1925c	1775	1795	1975d	2175	2275	121	32x4	Hatfield.....	55	H-S.. 11000	6-3 1/2 x 5	25.35	Strom...	Bosch...	s-p B&B.	Durston...	m Spicer	1/2 F Col.	4.63	R-L-R		
1995		1995	2150	(2695f)		132	33x5	Haynes.....	77	Own.....	6-3 1/2 x 5 1/2	31.54	Strom...	L-N...	s-p B&B.	Own...	m Univ...	1/2 F Own	4.60	R-L-R		
	1295		(1695b)	2195	(1895	121	32x4 1/2	Haynes.....	60	Own.....	6-3 1/2 x 4 1/2	29.40	Rayfield...	L-N...	s-p B&B.	Own...	m Univ...	1/2 F Own	4.41	R-L-R		
		1295	(1750d)		2495p																	
	1295	1350		1375d	1895	120	34x4 1/2	Hudson.....	Super 6	Own.....	6-3 1/2 x 5	29.40	Own...	Bosch...	m-d Own.	Own...	m Spicer	1/2 F Own	4.45	R-L-R		
1175	1175		1225a	1445	1750	115	32x4	Hupmobile...	Series R	Own.....	4-3 1/2 x 4 1/2	16.90	Strom...	West...	s-p B&B.	Own...	m Univ...	1/2 F Own	4.87	R-L-R		
1195	1065	960g	1220d	1325	1495	112	31x4	Jewett.....	Six	Own.....	6-3 1/2 x 5	25.36	Strom									

MISCELLANEOUS

a-2 Passenger d-5 Passenger
b-3 Passenger e-6 Passenger
c-4 Passenger f-7 Passenger
g-Chassis Price p-Sport Model
†-On Standard Phaeton Models
‡-Brougham §-Limousine
r-Price without starter and demountable rims. Price, complete, Ford \$350; Star \$414.
s-Price without starter and demountable rims. Price, complete, Ford \$380; Star \$443.

ENGINE

Anst-Ansted
Cont-Continental
Dues-Duesenberg




For a Merry Christmas and a Safe New Year

GIVE him a set of Weed Chains—the gift which completely expresses the spirit of Christmas—good will to men and peace on earth that comes from SECURITY!

When roads are slippery he will smile in gratitude as he snaps the Weed Chains securely on by pressing the new Lever Locking Connecting Hooks.

He will appreciate your tribute to him as a careful, intelligent driver who puts on Weed Chains whenever they are needed to make motoring safe for himself, his family and all those who use the streets and highways.

The name WEED is stamped on the cross chain hooks and Lever Locking Connecting Hooks of Weed and Weed De Luxe Chains. It stands for Safety and Economy.

AMERICAN CHAIN COMPANY, Inc.
Bridgeport  Connecticut

In Canada: DOMINION CHAIN COMPANY, LIMITED, Niagara Falls, Ontario

District Sales Offices:

Boston • Chicago • New York • Philadelphia • Pittsburgh • San Francisco

The World's Largest Manufacturers of Chains for All Purposes



WEED CHAINS



MR. DEALER: "Weed Chains for Christmas" sentiment took the public by storm last year. Let's work together again this year and bring about another Christmas landslide for Weed Chains. We are doing our part by running this advertisement in

The Saturday Evening Post, December 8th issue
The Country Gentleman, December 8th issue

The Literary Digest, December 8th issue
Successful Farming, December issue

The Farm Journal, December issue
The Sunset Magazine, December issue

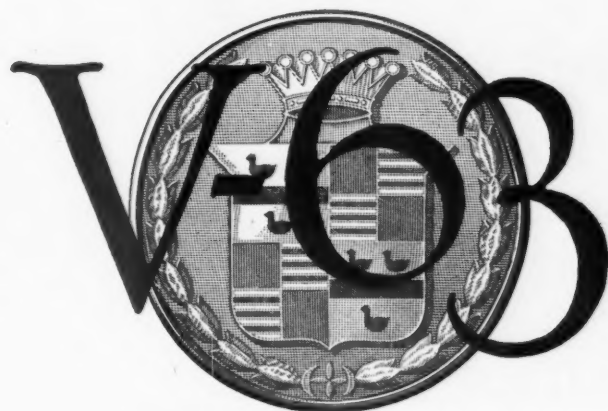
You can cooperate by asking your jobber for one of our 18-inch lithographs of the Weed Chain Christmas Wreath shown above with reproduction of this advertisement on reverse side. Stick this beautifully designed and colored Wreath on your door not later than December 1st, and be prepared for record-breaking sales of Weed Chains that will start shortly after Thanksgiving Day.

Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

PRICES						Wheel Base (Ins.)	Tire Size (Ins.)	NAME AND MODEL	ENGINE				ELECTRICAL SYSTEM		Clutch, Type and Make	Gearset Make	Universal: Type and Make	REAR AXLE		BRAKES, Service and Emergency
OPEN MODELS			CLOSED MODELS						Make and Model	No. of Cyls. Bore and Stroke	Horse Power Rating (N.A.A.C.)	Carburetor Make	Generator and Starter Make	Ignition Make				Type and Make	Gear Ratio	
2-3 Pass.	4-5 Pass.	6-7 Pass.	2-3 Pass.	4-5 Pass.	6-7 Pass.															
\$2385	\$1835	\$2385	\$2385c	3375	3075	124	32x4 1/2	Kissel.....45	Own.....	6-3 1/2x5 1/2	26.38	Strom...	Remy...	Remy...	m-d War...	Warner...	m Spicer	F Own	3.02	R1-R2
5000	5000	5000	4200c	3375	3075	132	33x5	LaFayette.....23	Own.....	8-3 1/2x5 1/2	33.80	Johnson	Delco.	Delco.	m-d Own.	Own...	m Own.	F Own	4.58	R1-R2
1795	1795	1795	2145d	2345	2345	123	32x4 1/2	Lexington.....23	Anst.....C	6-3 1/2x4 1/2	25.35	Rayfield.	G-D.	G-D.	m-d Own.	Warner.	f Sneed	F Own	5.10	R1-T1
3800	3800c	3800	4600c	4400	4900	136	33x5	Lincoln.....	Own.....	8-3 3/8x5	36.45	Strom...	Delco.	Delco.	m-d Own.	Own...	m Spicer	F Tim	4.58	R1-R2
8690	9500c	9600	11750	11750	11600	142	35x5	Locomobile... Series 8	Own.....	6-4 1/2x5 1/2	48.60	Ball&B.	West.	Delco.	m-d Own.	Own...	m Own.	F Own	3.85	R1-R2
2300g	2785	2785	2985a	3585	4285	136	32x4 1/2	Marmen.....34	Own.....	6-3 1/2x5 1/2	33.75	Strom...	Delco.	Delco.	m-d Own.	Own...	m Spicer	3/4F Own	4.10	R1-R2
2425g	2910	2910	3110a	3985	3985	136	32x4 1/2	Marmen.....34	Own.....	6-3 1/2x5 1/2	33.75	Strom...	Delco.	Delco.	m-d Own.	Own...	m Spicer	3/4F Own	4.10	F1-R2
795	795	p963d	895b	935	1195	109	31x4	Maxwell.....	Own.....	4-3 3/4x4 1/2	21.03	Stewart.	Remy.	Remy.	e Own.	Own...	f Own.	1/2F Own	4.60	R1-T1
5400	5600	5700	6720	6690	6810	140	33x5	McFarlan.....1923	Own.....	6-4 1/2x6	48.60	Rayfield.	West.	West.	m-d M&E	B-L...	m Peters	F Tim	3.75	R1-R2
3050b	3750c	3750c	3950c	4850	5250	132	32x4 1/2	Merced.....Series 5	Own.....	4-3 1/2x6 1/2	22.50	Ball&B.	West.	Eisem.	m-d Own.	Own...	m Spicer	F Own	3.87	T1-R2
1295	1295	1495d	1585c	1895	5000	132	32x4 1/2	Merced.....	Own.....	6-3 1/2x5	33.75	Strom...	Delco.	Delco.	m-d Own.	Own...	m Spicer	3/4F Own	3.77	T1-R2
				1895	115	115	31x4	Moon.....U6-40	Cont.....6 Y	6-3 1/2x4 1/2	23.41	Strom...	Delco.	Delco.	s-p B&B.	Warner.	m Spicer	1/2F Tim	5.10	R1-T1
		1785	1995c	2585	2485	128	32x4 1/2	Moon.....6-58	Cont.....8 R	6-3 1/2x4 1/2	27.34	Strom...	Delco.	Delco.	s-p B&B.	B-L...	m Spicer	3/2F Tim	5.09	R1-R2
1240	1240	1390	1615c	2090	2190	127	34x4 1/2	Nash.....691-3-6-7	Own.....	6-3 1/2x5	25.35	Marvel.	Delco.	Delco.	s-p B&B.	Own...	m Own.	1/2F Own	4.50	R1-T1
915	935	1195d	1195d	1890	2190	127	34x4 1/2	Nash.....692-4-5-8	Own.....	6-3 1/2x5	25.35	Marvel.	Delco.	Delco.	s-p B&B.	Own...	m Own.	1/2F Own	4.90	R1-T1
				1445	112	112	33x4	Nash.....41-8	Own.....	4-3 3/8x5	18.23	Marvel.	Delco.	Delco.	s-p B&B.	Own...	m Own.	1/2F Own	4.88	R1-T1
2475	2475c	2375	2485d	3250	3285	130	32x4 1/2	National.....BB	Own.....	6-3 1/2x5 1/2	29.40	Rayfield.	West.	Delco.	s-p B&B.	B-L...	m Univ.	F Col.	4.08	R1-R2
2500	2500c	2600c		3725	3500	128	33x5	Noma.....4C	Cont.....8 R	6-3 3/4x4 1/2	27.34	Zenith.	Delco.	Delco.	s-p B&B.	Detroit.	m Spicer	1/2F Tim	4.45	R1-R2
945	915	1095a	1195	1345	113	113	31x4	Oakland.....6-54	Own.....	6-2 1/2x4 1/2	19.00	Marvel.	Remy.	Remy.	e Hoos.	Muncie.	m Mech.	1/2F Own	4.70	F1-T1
750	750	885d	955	1035	110	110	31x4	Oldsmobile.....6	Own.....	6-2 1/2x4 1/2	18.15	Zenith.	Delco.	Delco.	s-p B&B.	Own...	f Ther.	1/2F Own	4.70	R1-T1
495	495	395g	750	795	695d	100	30x3 1/2	Overland.....91	Own.....	4-3 1/2x4	19.60	Till.	A-L.	A-L.	s-p B&B.	Own...	m Own.	1/2F Own	4.50	R1-R2
695				1095	106	106	30x3 1/2	Overland.....92	Own.....	4-3 1/2x4	19.60	Till.	A-L.	A-L.	s-p B&B.	Own...	m Own.	1/2F Own	4.50	R1-R2
2485	2485	2685	2650c	3175c	3275	126	33x4 1/2	Packard.....126	Own.....	6-3 3/8x5	27.34	Own.	A-K.	Delco.	m-d Own.	Own...	m Spicer	1/2F Own	4.66	R1-R2
3850	3650	4550c	4725	4700	333	333	33x1 1/2	Packard.....133	Own.....	6-3 3/8x5	27.34	Own.	A-K.	Delco.	m-d Own.	Own...	m Spicer	1/2F Own	4.66	R1-R2
2695	2450	2450	4900f	4950	143	143	33x5	Packard "Eight".....136	Own.....	8-3 3/8x5	36.45	Own.	Dyneto.	Delco.	m-d Own.	Own...	m Spicer	1/2F Own	4.70	F1-R2
			3235	3235	131	131	33x4 1/2	Packard "Eight".....143	Own.....	8-3 3/8x5	36.45	Own.	Dyneto.	Delco.	m-d Own.	Own...	m Spicer	1/2F Own	4.70	F1-R2
			2850f	3435	131	131	33x4 1/2	Paige.....6-70	Cont.....9 A	6-3 3/8x5	33.75	Rayfield.	Remy.	A-K.	m-d Long.	Warner.	m Mech.	3/2F Tim	4.60	R1-R2
1550	1390	1425	1465d	2395	120	120	32x4 1/2	Paterson.....23-6-52	Cont.....8 R	6-3 3/8x4 1/2	27.34	Strom...	Delco.	Delco.	s-p B&B.	Durston.	m Hart.	1/2F Salis	4.50	R1-R2
2690	2690	2750	2260g	3300	33840	128	33x5	Peerless.....23	Own.....	8-3 1/2x5	33.80	Ball&B.	Delco.	Delco.	m-d Own.	Own...	m Spicer	1/2F Tim	4.90	R1-R2
5250	5250	5250	6800	3690	138	138	33x5	Pierce-Arrow.....	Own.....	6-4 x5 1/2	38.40	Own.	Delco.	Delco.	m-d Own.	Own...	m Spicer	1/2F Own	4.29	R1-R2
	1695	1745	2445	2495	126	126	32x4 1/2	Pilot.....6-50	H-S.....90	6-3 1/2x5	25.35	Till.	Wagner	Wagner	s-p B&B.	Muncie.	m Blood.	3/2F Col.	4.67	R1-R2
2535	2535	2585d	2635d	3385	126 1/2	126 1/2	32x4 1/2	Premier.....6-D	Own.....	6-3 3/8x5 1/2	27.34	Strom...	Delco.	Delco.	s-p B&B.	Own...	m Spicer	3/2F Tim	4.58	R1-R2
	2300	2375	2400c	3000d	3050	124	32x4 1/2	R & V Knight.....H	Own.Kn'gt	6-3 1/2x4 1/2	29.40	Strom...	A-L.	A-L.	s-p B-L.	B-L.	m Spicer	1/2F Tim	5.40	R1-R2
	1335	1545d	1875	d2235	120	120	32x4	Reo.....T6	Own.....	6-3 1/2x5	24.34	Rayfield.	N.E.	N.E.	s-p B-L.	B-L.	m Spicer	1/2F Tim	5.70	R1-R2
3200c	3200	3200c	4000	1985	131	131	32x4 1/2	Revere.....M	Dues.....	6-4 1/2x6	30.63	Strom...	West.	Bosch.	m-d B-L.	B-L.	m Spicer	3/4F Std	3.44	R1-R2
1485	1485	1885c	1985	117	117	117	32x4	Rickenbacker.....B	Own.....	6-3 1/2x4 1/2	23.44	Strom...	Bosch.	Bosch.	s-p Own.	Warner.	m Mech.	3/2F Col.	4.63	F1-T1
1635	1635	2035c	2135	117	117	117	32x4	Rickenbacker.....B	Own.....	6-3 1/2x4 1/2	23.44	Strom...	Bosch.	Bosch.	s-p Own.	Warner.	m Mech.	3/2F Col.	4.63	F1-T1
2685	2485	2685	2750c	3285	128	128	32x4 1/2	Roamer.....6-54-E	Cont.12XD	6-3 1/2x5 1/2	29.40	Strom...	West.	Split.	s-p B&B.	G-L.	f Sneed	3/2F Tim	4.60	R1-R2
			4250f	3950	138	138	32x4 1/2	Roamer.....6-54-E	Cont.12XD	6-3 1/2x5 1/2	29.40	Strom...	West.	Split.	s-p B&B.	G-L.	f Sneed	3/2F Tim	4.60	R1-R2
3685	3485	3800	3650c	4650f	128	128	32x4 1/2	Roamer.....4-75-E	Roach.....	4-4 1/2x6	28.90	Strom...	West.	Split.	s-p B&B.	B-L.	f Sneed	3/2F Tim	4.08	R1-R2
10900	10900	10950		12800	143 1/2	143 1/2	33x5	Rolls-Royce....40-50	Own.....	6-4 1/2x4 1/2	48.60	Own.	Bijur.	Bosch.	e Own.	Own...	m Own.	F Own	3.70	R1-R2
				13500	118	118	32x4	Rubay.....	Own.....	4-2 1/2x5 1/2	12.10	Strom...	Bosch.	Bosch.	s-p Own.	Own...	m Univ.	F Own	5.10	F1-R2
				5100	118	118	33x4	Sayers Six.....DP	Cont.....8 R	6-3 3/8x4 1/2	27.34	Strom...	Delco.	Delco.	s-p B&B.	G-J.	m Arvac.	1/2F Std.	4.75	R1-R2
1615	1615	2615d	2615		108	108	30x3 1/2	Seneca.....L-2 & O-2	Lye.....KB	4-3 1/2x5	19.60	Zenith.	A-L.	A-L.	s-p B&B.	G-L.	m Univ.	F Peru	4.75	R1-R2
875	875				112	112	31x4	Seneca.....50c & 51c	Lye.....KB	4-3 1/2x5	21.03	Zenith.	A-L.	A-L.	s-p B&B.	G-L.	m Univ.	F Peru	4.50	R1-R2
985																				
2750	2750	2750	2425g	3585	3985	130	32x4 1/2	Stanley.....740	Own.....	2-4 x5		None.	Bijur.	None.	None.	None.	None.	1/2F Own	1.50	R1-R2
319c	343a	285c	590	645	102	102	30x3 1/2	Star.....	Cont. Spec	4-3 1/2x4 1/2	15.63	Till.	A-L.	A-L.	s-p Own.	Warner.	m Spicer	3/2F Tim	4.87	R1-R2
2250	2250	2150	2275c	3150	125	125	31x4 1/2	Stearns-Knight.....SKL4	Own.Kn'gt	4-3 1/2x5 1/2	22.50	Schebler.	West.	A-K.	m-d Own.	Own...	f Cli.	3/2F Own	4.50	R1-R2
2700	2700	2850	2700c	3350	130	130	34x4 1/2	Stearns-Knight.....6	Own.Kn'gt	6-3 3/8x5	27.34	Schebler.	West.	A-K.	m-d Own.	Own...	f Cli.	3/2F Own	4.70	R1-R2
				3700f	117	117	32x4	Stephens.....10	Own.....	6-3 1/2x4 1/2	25.35	Strom...	Delco.	Delco.	s-p B&B.	Mech.	m Mech.	3/2F Tim	5.10	R1-T1
1445	1395	1745	2145c	2385	124	124	33x4 1/2	Stephens.....20	Own.....	6-3 1/2x4 1/2	25.35	Strom...	Delco.	Delco.	s-p B&B.	Mech.	m Mech.	3/2F Tim	5.30	R1-T1
	2230			2700	125	125	32x4 1/2	Sterling-Knight.....	Own.Kn'gt	6-3 1/2x4 1/2	25.35	Strom...	West.	West.	m-d	Own...	m Mech.	3/2F Tim		R1-R2
975	995	845g	1225	1550	112	112	31x4	Studebaker.....Light Six	Own.....	6-3 1/2x4 1/2	23.44	Strom...	Wag-It.	Wag-It.	s-p Own.	Own...	f Ther.	3/2F Own	4.55	R1-R2
1325																				

E X P E C T G R E A T T H I N G S



It is doubtful if even the most enthusiastic Cadillac dealer could have foreseen the reception the new V-63 is now enjoying.

CADILLAC MOTOR CAR COMPANY, DETROIT, MICH.
Division of General Motors Corporation

CADILLAC



S T A N D A R D O F T H E W O R L D

A Christmas Gift That You Can Sell Easily and Profitably



The AC Plug Kit makes a Christmas gift that you can sell easily and profitably because it is both attractive and useful.

It is a well-made, metal box with hinged cover. It is finished in dark blue with orange and white lettering. With the Christmas trim, as pictured above, it is even more attractive for gift purposes.

A Kit of AC Spark Plugs to carry in the car as spares is a useful gift because it makes it convenient to change plugs when the motor misses or performs poorly. The spare plugs are always in good condition because the Kit protects them from damage.

The price of the Kit complete with four AC Spark Plugs is within the range of every pocketbook.

A supply of the Kit trims pictured

above together with display material that will attract Christmas buyers is contained in the AC Christmas Envelope. Your jobber will have these Envelopes ready for distribution beginning Nov. 1—be sure you get yours.

You can increase your AC plug business greatly by taking advantage of this opportunity.

Check your stock of AC Plugs and Kits today and order the additional stock you will need for the Christmas trade.

The Standard
Spark Plug of
the World



AC Spark Plug Company, FLINT, Michigan

Makers of AC Spark Plugs—AC Speedometers

U. S. Pat. No. 1,135,727, April 13, 1915, U. S. Pat. No. 1,216,139, Feb. 13, 1917. Other Patents Pending

The AC Speedometer—Feature it as a
Christmas gift for the Ford or Star driver

GARDNER

Here to Stay

THERE are today 106 manufacturers of passenger motor cars.

Some of them are here to stay.

Dealers who are building for permanency must know that the manufacturer whose car they represent will last.

The manufacturers of the Gardner car have been in business for 40 successful years.

Gardner is here to stay.

*A Complete Line of 1924 Gardner Models
Now Available*

THE GARDNER MOTOR CO., INC.

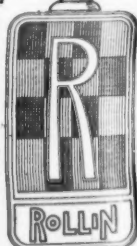
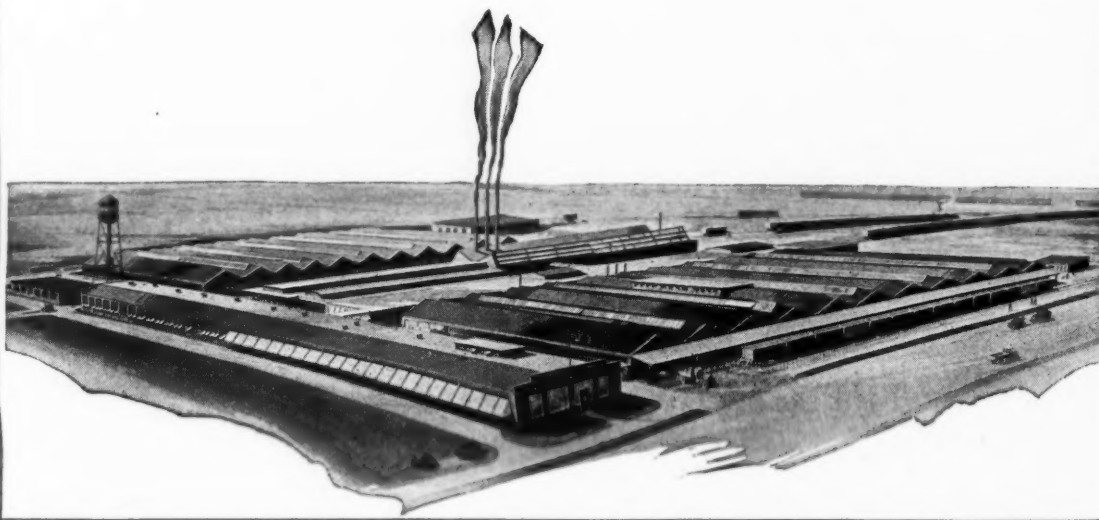
ST. LOUIS, U. S. A.

"Vehicle Builders Since 1882"

GARDNER

ROLLIN

Let us take you thru our new and modern plant. We want you to know the painstaking methods used in the manufacture of our motors and other important units. The Rollin is now in production.



ROLLIN

A Word About the Up-to-Date Plant Back of the New Car Designed by R. H. White

This superb car is backed by men who have contributed liberally to the industry's success.

We have complete manufacturing facilities which make possible quantity production of the fine new Rollin.

Our plant, illustrated on opposite page, is unique in the way of especially fine equipment.

Situated in the heart of Cleveland's best manufacturing district.

On the main lines of the New York Central and Nickel Plate Railroads. Four tracks into the plant.

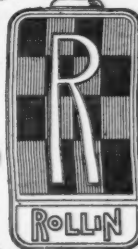
And, note this especially—the men who control the policies of the Rollin Motors Company know that their success can only be measured by the goodness of the product and the success of the men who sell this new car.

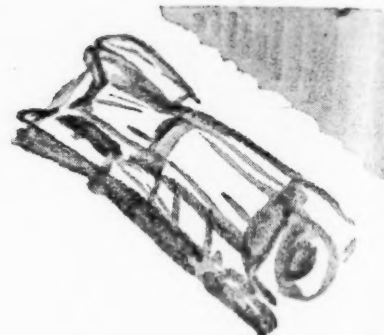
That's why it is advisable to get in touch with us right now.

Just tell us you are open for a high quality, interestingly priced, four cylinder car that is designed and built along European lines.

We will detail a selling franchise plan that will appeal to every good motor car dealer who is alive to the main-chance. Write or wire.

THE ROLLIN MOTORS COMPANY
CLEVELAND OHIO





When You Take a Curve at "25"

The next time you take a curve at "twenty-five"—
When you feel an unseen force pull you to the side—
When you push the floor boards and grip the wheel
to keep erect on the seat—

Just visualize (the next time you take that curve)
what this same unseen force is doing in the bearings
of your wheel hubs—

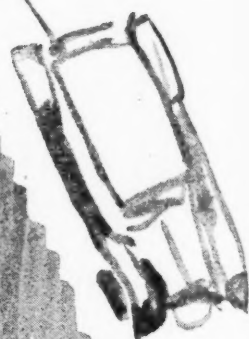
Bearings that are revolving at high speeds while carrying
the whole weight of your car, up and down—

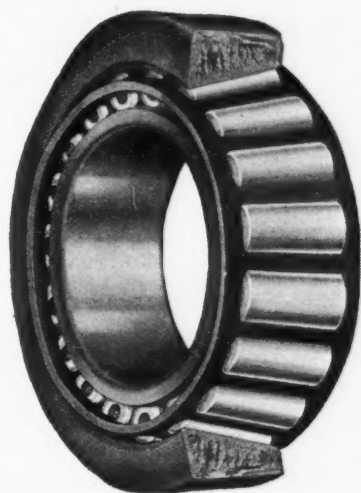
And also carrying the still more powerful force that
you, up on the seat, feel in lesser degree—the *weight
of a heavy automobile trying to follow a straight
line, although it is being steered and pulled
around a curve.*

That is the complicated double duty of your anti-
friction bearings on the curves at "25"—simultaneously
reducing the friction of a heavy (radial) load from
above; and heavy (thrust) loads from the side; and
suddenly changing combinations of the two.

Naturally, more than 90% of all automotive vehicles
made today are equipped with Timken Tapered Roller
Bearings—the "dual service" bearings that simulta-
neously carry *all* loads—radial loads *and* thrust loads
and resultant loads.

The Timken Roller Bearing Co
CANTON, OHIO





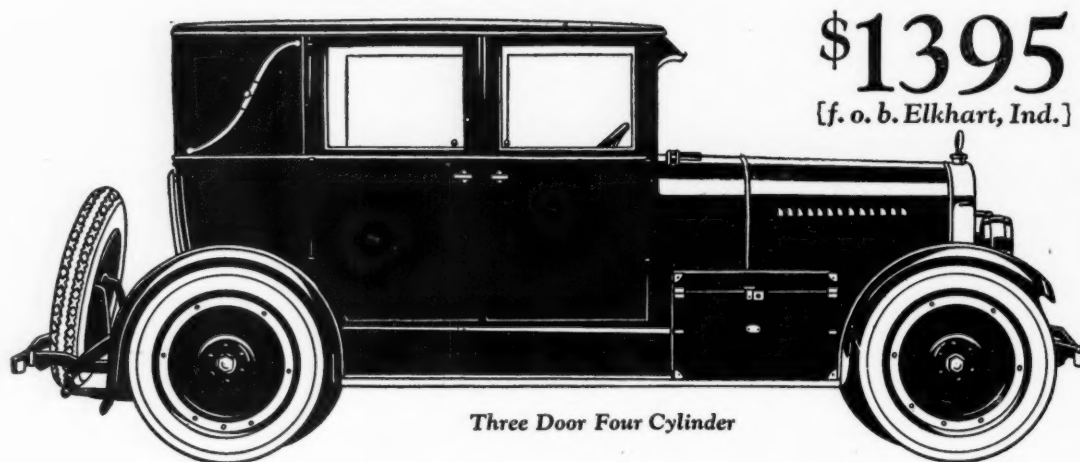
TIMKEN
Tapered
ROLLER BEARINGS





An ELCAR Triumph!

The Three Door Sport Brougham



\$1395

[f. o. b. Elkhart, Ind.]

Three Door Four Cylinder

The startling value presented in the new 1924 ELCAR Three Door Four Cylinder Sport Brougham is alone sufficient to assure success to ELCAR dealers. Grace of line and perfection of coachwork, ELCAR engineering and the Lycoming 5-bearing motor make it outstanding among the models presented for 1924. Let us tell you more about this great car and the great line of which it is a feature.

SIXES
Continental Motored
Closed and
Open Models

ELCAR
A WELL BUILT CAR

FOURS
Lycoming Motored
Closed and
Open Models

ELCAR MOTOR COMPANY, Elkhart, Indiana :: Builders of Fine Vehicles Since 1873



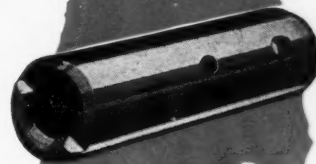
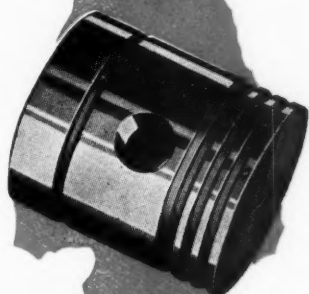
Arrow Head Shafts Fit

OUR inspectors will not permit any variation from specification in the dimensions of Arrow Head Axle and Drive Shafts. The machining *must* be carefully done.

The material is specially developed for us and guaranteed to have a tensile strength of at least 125,000 lbs.

Arrow Head Axle and Drive Shafts will live up to the recommendation of the most reliable mechanic.

ARROW HEAD STEEL PRODUCTS CO.
MINNEAPOLIS, MINNESOTA



Arrow Head Products

The "Arrow Head" is Your Guarantee



HOLLEY
Announces—
A New device for
Ford Cars

HOLLEY CARBURETOR COMPANY

Severe tests under every conceivable service condition have proved that a Ford engine, equipped with this new device, develops more power on hills, starts quicker in winter, and effects a great saving in fuel.

For further details about this new product and attractive dealer plan fill in and mail this coupon—now.

Holley
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Company,
Detroit, Mich.

Send full information about the new
Holley Device for Ford
Cars and Trucks, and dealer
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DETROIT, MICHIGAN

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NICHOLAS FOX

Started April 13, 1856

67 Years

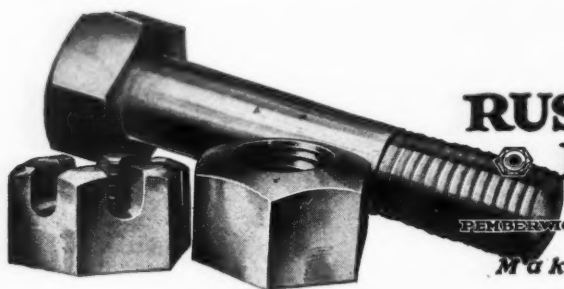
With Russell, Burdsall & Ward



A Significant Fact
The "more-than-thirty-years" honor roll at the Russell, Burdsall & Ward plants now contains 82 names

THE knowledge that comes from experience is handed down from generation to generation in the Russell, Burdsall & Ward plants.

The skill of the beginner is constantly measured by the skill of the master.



RUSSELL, BURDSALL & WARD
BOLT & NUT COMPANY

PORT CHESTER, N.Y.

PEMBERTON, CONN. • CHICAGO • SAN FRANCISCO • ROCK FALLS, ILL.

Makers of Bolts, Nuts and Rivets Since 1845

EMPIRE BOLTS

FORCED into the Replacement Field

Hycoe

*Folded and Stitched
Hydraulic Compressed*

BRAKE LINING

"HYCOE" Brake Lining has never before been offered to the jobber dealer trade. The phenomenal service rendered by millions of feet of "Hycoe" installed as original equipment has caused such widespread comment as to result in an insistent demand for "Hycoe" in the replacement field. We want reliable jobbers and dealers to handle the distribution.

Apply to our nearest branch for our proposition.

Having manufactured brake lining for 15 years, our experience and research has enabled us to produce "Hycoe," the brake lining that stops the car as the driver wants it stopped. Instantly in emergencies; gradually yet positively for ordinary driving. No slip, grab or chatter. Unbiased tests by disinterested engineers prove the authenticity of our statements.

Lowest cost PER MILE!

THE MANHATTAN RUBBER MFG. CO.

Executive Offices and Factories

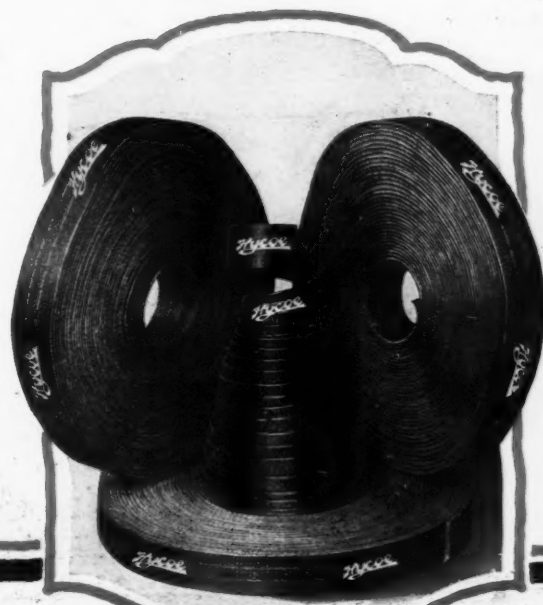
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DOMINATE!

your local market with these two good cords

Any good tire merchant can dominate his market with Kokomos.
For the customer who wants the heaviest, sturdiest tire that can be had, and is willing to pay the standard cord price—KOKOMO HEAVY DUTY CORDS.

For the customer who wants a good cord tire—staunch, handsome, oversize, at a price but slightly higher than fabrics — KOKOMO CRUSADER CORDS.

The Kokomo Line is complete. All sizes in both of these cords, and a line of fabrics; too. Write.

KOKOMO RUBBER CO.

KOKOMO, INDIANA

LONG ~ LIFE KOKOMO TIRES AND TUBES

KOKOMO HEAVY-DUTY CORD

For hard going, for day-in-and-day-out service. The sturdiest tire that runs on the road.



KOKOMO CRUSADER CORD

A big, all black, cord tire. Safe, strong, dependable, handsome, at a really moderate price.

A Xmas Item

Attractiveness and low price make this a rapid selling Xmas item. Xmas display card in each carton.



Sockets are heat-treated to give a file-hard wearing surface with tough core. The steel handle is not the usual 7/16" hex., but is 1/2" making a comfortable handle. Both sockets and handles are mottled.

Box is heavy gauge pressed steel, baked-on black enamel with N. B. trade-mark in gold. The cover is conveniently hinged at one end.

Without question the most attractive Socket Set yet put on the market.

Put this on your counter It Sells Wrenches

Thousands already sold

The outstanding socket wrench success of the year. Thousands of sets already sold—and our advertising is just starting.

It is a Display Carton that makes the Set sell itself—to 8 out of 10 car owners. They see the wrenches, handle them, buy them. \$1.25 sales made automatically.

Not an experiment—made by the builders of "New Britain Automatics," in use by automotive plants everywhere.

JOBBERS—This Socket Set has made a decided hit with every jobber who has seen it. Write today for sample set and DISCOUNTS. Dealers—Write your jobber.

The New Britain Machine Co.
Screw Products Dept.
New Britain, Conn.



NONE BETTER

No. 3 Socket Set

Give Dad a ROSE High Pressure Lubricating System or a Tire Pump this Christmas

A Christmas Suggestion

Mr. John Jones, 321 4th St., New York City

Dad deserves a Good Present this Christmas

He will like these!

ROSE High Pressure Lubricating System

ROSE Tire Pump

Mail these double-postals to your customers about December 10th—just at the time when most folks are beginning to wonder what they are going to give for Christmas. They will bring folks into your store. That's what you want.

These Free Helps Will Bring You Christmas Business

At Christmas time the whole world has money to spend. The man that gets the business is the man who goes after it with the right ammunition. Here is a campaign specially prepared to bring you Christmas trade. It is free to you for the asking. Put this beautiful 3-color poster in your windows to catch passing shoppers. Mail out these double postals to your customers and give them the "Automotive Christmas Gift" suggestion. At no other season of the year are people so responsive to advertising.

Folks want to buy gifts that are both useful and appropriate. What could be more acceptable to the man with a car than a Rose Tire Pump or a Rose High Pressure Lubricating System?

As an added point of attractiveness we have wrapped these two items in holly paper and crimson ribbon, with a gift card attached. Order your Christmas stock, your posters and postal cards from your jobber at once.

Let's make this the biggest automotive Christmas in history!

FRANK ROSE MFG. CO., Hastings, Nebr.



"Halt!"

"Halt!"—that's exactly what the Bowser Chief Sentry says.

Ever since there were automobiles, these Bowser Sentry pumps have been halting oncoming automobilists—to the profit of the filling station.

And with this beautiful pump, Chief Sentry 102, you can more than ever before be sure of building a larger business. 102 is a big, man's size pump—works fast and easy, and has the famous Bowser filter—the one that takes out all the dirt and water as the gas is served.

Send us a photograph of your filling station and we will paint in a picture of the Chief Sentry 102, and show you just how it will look when you install it. No obligation, of course. Folder A-14 will also be sent FREE. Write today, and we will show you why Bowser equipment for selling gas and oil is the money-making equipment you should have.

S.F. BOWSER & COMPANY, Inc.

Pump and Tank Headquarters

FORT WAYNE, INDIANA.

Sales and Service Offices and Representatives Everywhere

This is good 102—first put in use in 1913, and still the most widely known gasoline pump.

The AERMORE Exhaust Horn

Takes Your Car Out of the "Honk Honk" Class

"The Signal with a Smile"



A part of every Aermore Horn outfit, also sold separately for exhaust heaters. Self-closing.

For exhaust pipe 1½ to 3 in., \$1.80
For exhaust pipe 3½ to 4½ in., \$3.50

Prepare for an Automotive Christmas

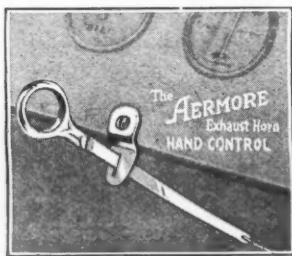
Satisfaction Guaranteed



Let the pleasant tone of the Aermore clear the road for you. It's safer, better in every way than ordinary signals. The Aermore may be heard for a mile or more yet is not harsh or disagreeable. It always works. Weakened batteries, defective wiring do not affect it. Operates by exhaust gas. Easily attached. Outlasts the car.

DEALERS

Demonstration stand free with order of 10 or more Aermores—one or assorted sizes.



Fulton Shellerite Steering Wheel

Adds to the comfort of driving. Dresses up a car. Will not crack or fade. Made of composition hard rubber. Standard equipment on a number of high-priced cars. Aluminum spider inserted in rim. Beaded top corrugated with outside hand grip. Diameter of wheel 17 inches. For Chevrolet, Star, Dodge, Maxwell, or Overland Cars, \$6.00
For Fords 5.50

Ask your Dealer. Dealer write Jobber or us.

Address Dept. 15

Manufactured by



The Fulton Company Milwaukee, Wis.

PRICES	
Complete with Valve and Fulton Hand Control.	
No. 00—22 in. long, Motor	
Bus Special	\$14.00
No. 0—17 in. long, for large autos, trucks	12.00
No. 1—15 in. long, for medium cars	10.00
Ford Special	7.00
Give name of car and outside diameter of exhaust pipe.	



There is a way for **YOU** to make real profit
and to give your customer full value for his money.

Over thirteen million cars and trucks hopping bumps pave the way for reputable dealers, garages and repair shops to become money-making TITANIC spring service stations.

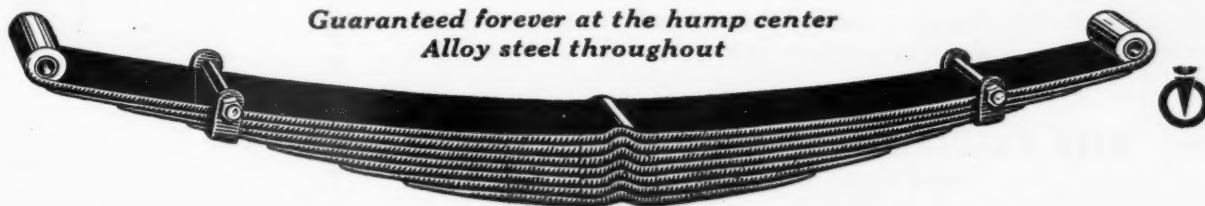
TITANIC Springs are the result of forty-three years' manufacturing experience. They are distributed by two hundred leading jobbers, serviced by over twelve hundred authorized service stations and sold by thousands of dealers, *profitably*.

There is profit and good will in replacing with a spring *not* like the one that broke.

The Tuthill Merchandising Plan practically sets you up in the spring replacement business. A conservative stock, road signs showing your name and address, posters, circulars, genuine sales cooperation will enable **YOU** to make the same profit others are making. Ask us or any distributor about our singular offer on

TITANIC SPRINGS

*Guaranteed forever at the hump center
Alloy steel throughout*



TUTHILL SPRING COMPANY 760 Polk St., Chicago, Ill.

Builders of quality springs for over forty-three years



Anyone Will Wait Two Minutes for This New Dash Switch

This new switch was designed by the Cutler-Hammer engineers so that it could be installed on any dash in two minutes' time. Only a single 7-16" hole is required—there are no screws to align—no measurements to fuss about—not even a plate to square with the other instruments. Just drill or punch this hole in the dash (either wood or metal of any thickness), adjust the set-nuts, insert the stem, turn on the nicked collar, and the switch is mounted rigidly in place.

It is no longer necessary to make a customer leave the car—or wait the better part of an hour while a rectangular hole is chiseled in the dash. This new switch can be installed while they stop for gas or oil; while the lady driver shops in an adjacent store—even while an assistant is mounting a newly purchased spotlight or other accessory, you can install this switch for its control.

Profits quickly follow your suggesting it to every customer. Your minimum labor charge (twenty-five or fifty cents) for the few minutes required makes your time earn dollars—in addition to the profit made on the switch sale. Many motorists who would neither bother with the old type nor pay to have the work done will purchase this new switch to install at home, opening further channels of gain for the live dealer. Order a carton of twenty from your jobber today. If he has not yet been stocked, write direct and we will see that you are supplied.

THE CUTLER-HAMMER MFG. CO.

Switch and Specialty Department

Works: MILWAUKEE and NEW YORK



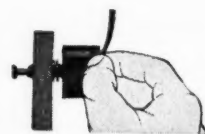
One Hole

AUTOMOBILE SWITCH

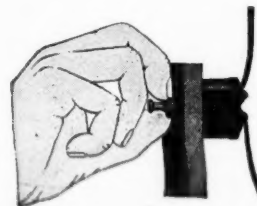
Easiest to Install



Drill or punch one 7-16 inch hole in the dash at point where the switch is desired.



Adjust set-rings to thickness of dash and insert switch stem.



Turn home the knurled locking collar and the switch is installed. Note mechanism is completely enclosed. Full sized binding screws with cupped washers make wiring easy.

Too Much Loose Talk About Baked Enamel

FOR some years the term "baked enamel" has meant just one thing to motorists—the finish put on most hoods and fenders—by a bona fide 300° to 400° process.

Such baked enamel, or more properly *Japan*, is now possible on bodies as well—but by only two methods.

First—the baking of all-metal bodies or parts just as fenders and hoods have been done.

Second—the baking of wood-frame bodies by the Oxvar Method.

We deplore, therefore, the recent tendency to abuse the term—by applying it loosely to *plain paint* that is dried up rapidly at 115° to 200°.

It is or should be common knowledge that such drying drives out or oxidizes the life giving oils of paint, causing premature breakdown.

True "baked enamel," on the other hand, requires at least 300° before it is "set"—and up to 400° to give you "the finish that lasts as long as the car."

We hold nothing against paint—we make it in quantity. Still to us paint is paint and baking enamel is baking enamel—two radically different products—and with results in body finishing that are far apart. For instance, baked enamel outlasts paint 4 to 1, costs but $\frac{1}{2}$ as much in labor and materials, takes $\frac{1}{4}$ the time, $\frac{1}{3}$ the floor space, and so on.

It seems apparent that the day of universal baked enameling of bodies must be close at hand.

This is most gratifying to us for we are able to give the Oxvar Method, without premium, to the automotive industry.

Booklet describing Oxvar (for production of twenty-five bodies or more daily), will be mailed on request.

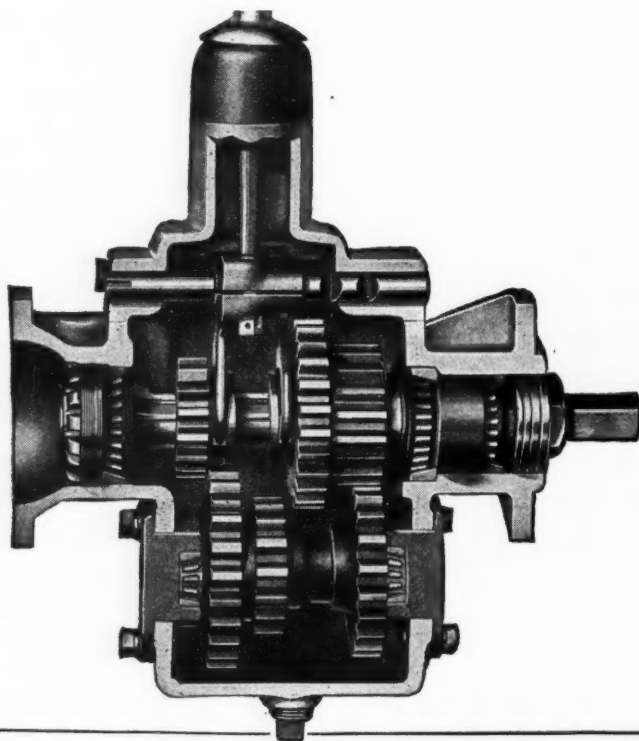
OXVAR

OXFORD VARNISH CORPORATION

Main Office: Empire Building, Detroit
Plant: Toledo, Ohio



Thousands know the Warford-equipped Ford as a top-notch two-ton truck which works on one-ton costs! Warford Auxiliary Transmission supplements Ford sturdiness with six forward speeds. The OVERDRIVE allows top speed with an easy-going engine. The UNDERDRIVE provides pull that challenges all two-ton competition. Warford ton-mile records are the strongest appeal ever made to the two-ton market. This added field opens a new path toward a record truck sales volume. Profit from these possibilities. Write us. The Warford Corporation, 44 Whitehall Street, New York.



AUBURN, N. Y.
Foster-Warford Co.

CANTON, Ohio
Dine-De Wees Company
400 Walnut Ave., S. E.

DALLAS
Houdaille-Polk Co.
2218 Commerce St.

DAVENPORT, Iowa
Sieg Company

DENVER, Motor
Specialties Company
17 W. 13th Avenue

MEMPHIS
Continental Body Co.
476 Union Ave.

MINNEAPOLIS
McGee White Corporation
1311 Hennepin Ave.

NEW YORK
Motive Parts Corporation
796 10th Ave.

SAN FRANCISCO
Warford-Pacific Co.
1111 Post Street

STOCKBRIDGE, Mich.
Transmission Sales Co.

VANCOUVER, B. C.
E. W. Jay

WICHITA, Kans.
Price Auto Service Co.
301 S. Topeka Ave.

Warford
AUXILIARY TRANSMISSION

70,843

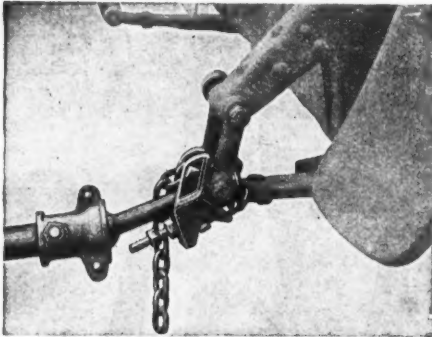
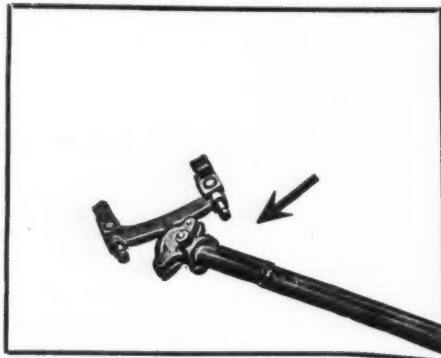
Monogram Caps
—initial shipment
October 20th, for
1923 Christmas
wholesale busi-
ness. Is YOUR
stock in that
seventy thousand?

Think of This!

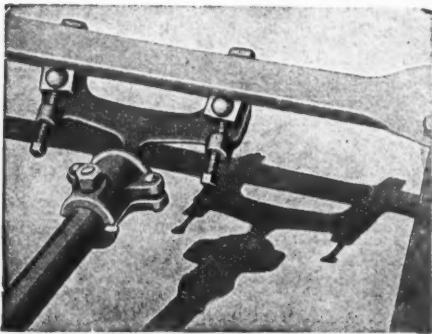
MONOGRAM
ORIGINAL
SELF LOCKING RADIATOR CAP

Universal Joints

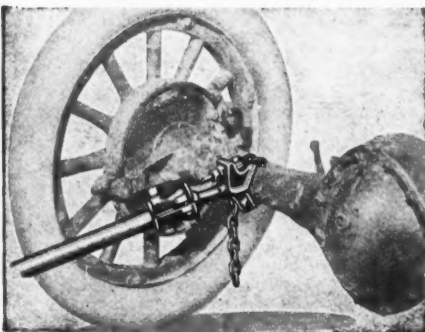
Make this a Better Towing Pole



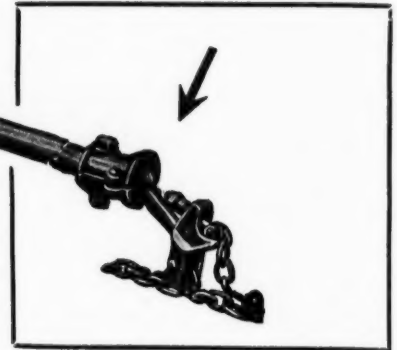
Connection to rear spring-shackle



Connection to front axle



Connection to rear axle housing



Another Manley Success!

EVERY bent, twisted, strained or broken towing pole is evidence that the design is wrong. We have been at work on a new and **BETTER** kind of towing pole and are now pleased to announce it.

The **MANLEY** Towing Pole is a Manley product throughout—designed and built in the regular **MANLEY** way, with improvements that leave competition far behind.

Side-to-side turns and up-and-down movement between the two cars are taken care of by **TWO BALL AND SOCKET JOINTS**—the greatest single improvement ever built into any towing pole. **FLEXIBILITY** in every direction—without loose connections. The **MANLEY** is **RIGID**. And there are **NO SPRINGS**. (Springs are used in a towing pole only to absorb the jerk

as the lost motion of the loose connections is taken up.)

The second big improvement over other towing poles is the **MANLEY** method of connecting it to the cars. One end is equipped with a "V" fork and a chain (similar to a chain pipe-wrench) and fastens to the spring-shackle or to the axle direct, as shown in the cuts. The other end of the **Manley Pole** is a yoke containing two tapered, swiveling blocks with set-screws. This end fastens **UNDER** the front axle of the towed car (to avoid the splash pan) or to the front bumper.

The design of the **Manley** pole is mechanically correct—you could tow a car from New York to San Francisco with it and the pole would be still in good condition. Try this with any other.

Built entirely of steel and malleable iron. Seven feet long, coming apart in two 3½ ft. sections. Weight 38 lbs. PRICE \$15. Worth double.

From your jobber. Catalog from us.

MANLEY MFG. CO. YORK, PA.

Manley

Garage Equipment

MADE IN YORK PA.



DORT

Announces

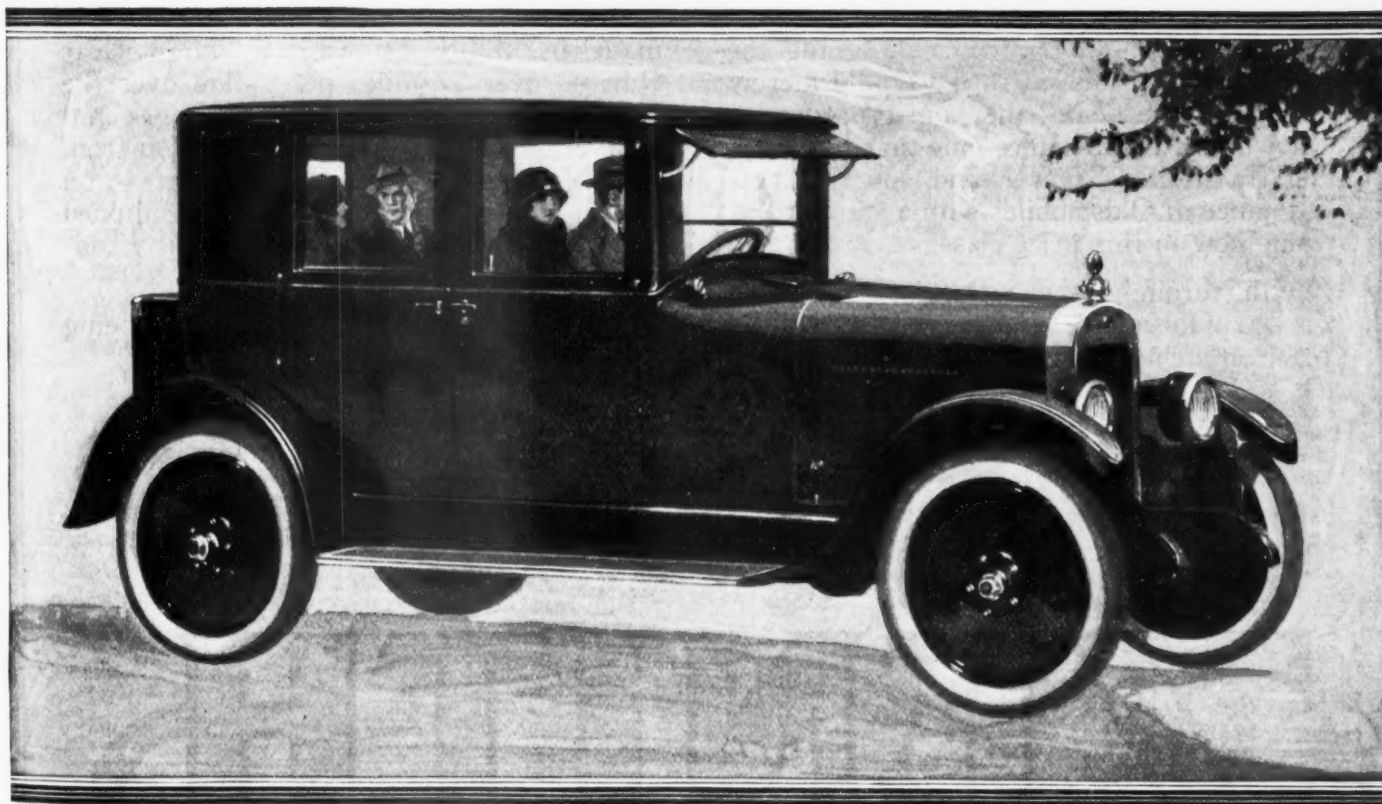
A Complete Line of New Body Models

Touring Car, Sport Touring Car, Sedan, Brougham, Three-Door Coupe

These new bodies are *roomier*. Doors are *wider*. Windows *larger*. Seats have been made more comfortable with extra deep cushions—plenty of leg-room. There is a *new radiator design* and the hood is higher and longer. Steering is easier. Important improvements have been made in the riding quality. These

beautiful new Dorts are *bigger* and *more luxurious* in every respect. Built around the same dependable chassis and the same powerful six-cylinder motor, that operates in a bath of oil, they provide a definitely greater measure of *value* than anything the motor world has known. *See them today!*

DORT MOTOR CAR COMPANY, FLINT, MICHIGAN

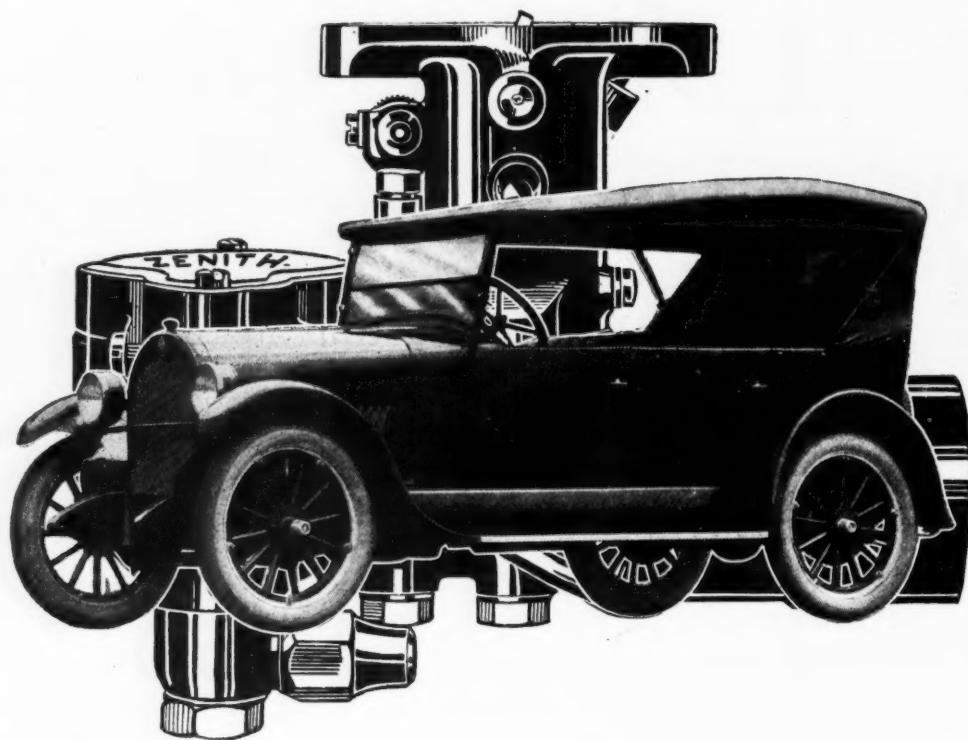


This Five-Passenger, Three-Door Coupe has two doors on right side and one on left. Seats set to permit every driving convenience. Rear trunk provides great storage space. Equipment includes stop light, side lights, sun visor, cowl venti-

lator, motometer, spare tire furnished with car, tire carrier on side, curtains, full crown fenders, windshield cleaner, front bumper and disc wheels. Finished in beautiful lake blue, with black running gear. Polished nickel radiator and nickel trimmings. (1648)

Touring Car, \$1095—Sport Touring, \$1245—Three-Door Coupe, \$1535—The Brougham, \$1535—Sedan, \$1595
F. O. B. Flint

Power with Economy in New Oldsmobile



Oldsmobile Engineers, when designing the new Six, were not satisfied to build merely a lower priced Six—they must produce a car worthy of the name—one that combined the tradition of power and superior performance of Oldsmobiles with a standard of value new in this price class.

Zenith, through its wonderful performance on the Oldsmobile Four, had earned its place on the new Six; and the record already

made by the Coast-to-Coast, High Gear Run — over 27 miles per gallon over the highest points of the Eastern Ranges and an average of over 30 miles per gallon from New York to St. Louis—demonstrated in a striking manner that the Zenith-equipped Oldsmobile combines *Power with Economy*.

Any car—or truck—is made better by being equipped with Zenith.

ZENITH-DETROIT CORPORATION

Manufacturer of

ZENITH CARBURETORS
DETROIT, MICHIGAN

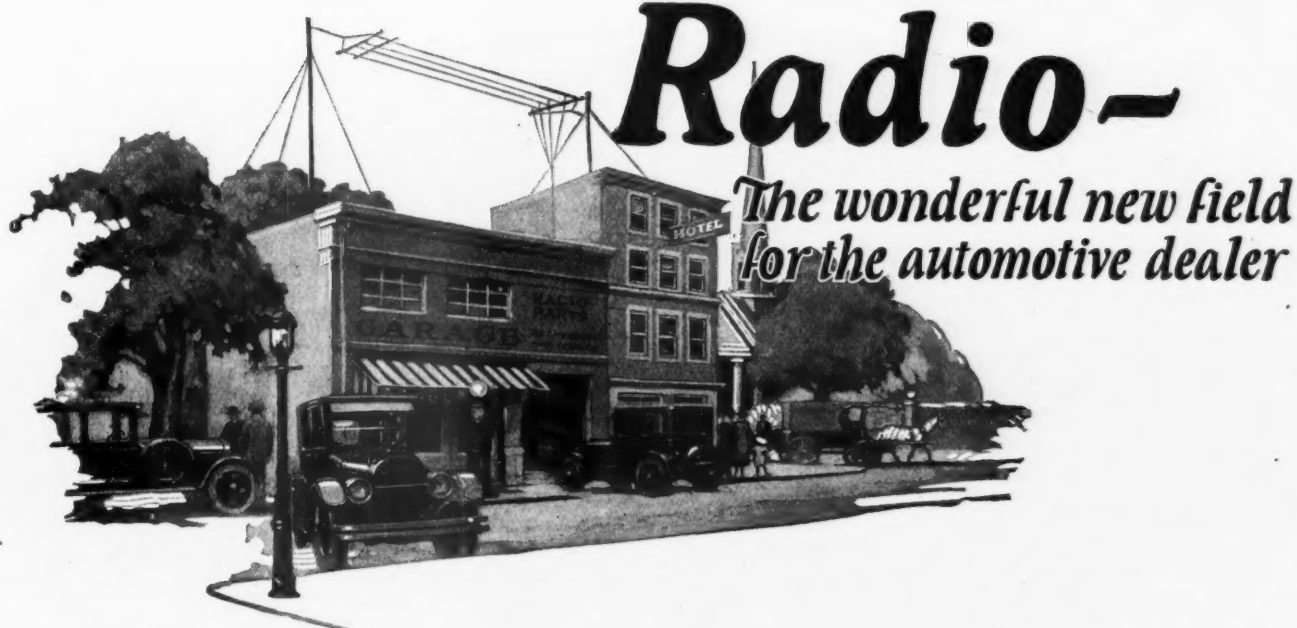
New York

Cleveland

Chicago

ZENITH

CARBURETOR



*The wonderful new field
for the automotive dealer*

HAVE you watched the growth of the radio business? Do you realize that this wonderful new thing will soon be in the home of every family in the land? The demand is increasing by leaps and bounds, and no one is more suited to take care of this business than the automotive service station.

To you, with your experience in servicing the comparatively complicated electric systems of motor cars, radio service will be easy. Big radio sales come during the Fall, Winter and early Spring months, at the time when your business is comparatively dull. Let radio balance your sales.

CROSLEY
Better - Cost Less
Radio Products

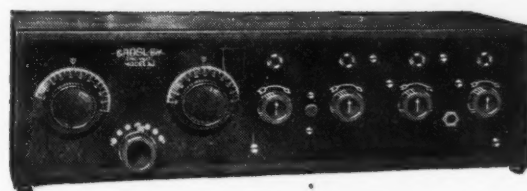
are nationally known. They are easy to sell. The public is waiting for you to supply them. Write to-day for dealer's proposition.

CROSLEY MANUFACTURING COMPANY

Powel Crosley, Jr., President

10534 ALFRED ST.

CINCINNATI, OHIO

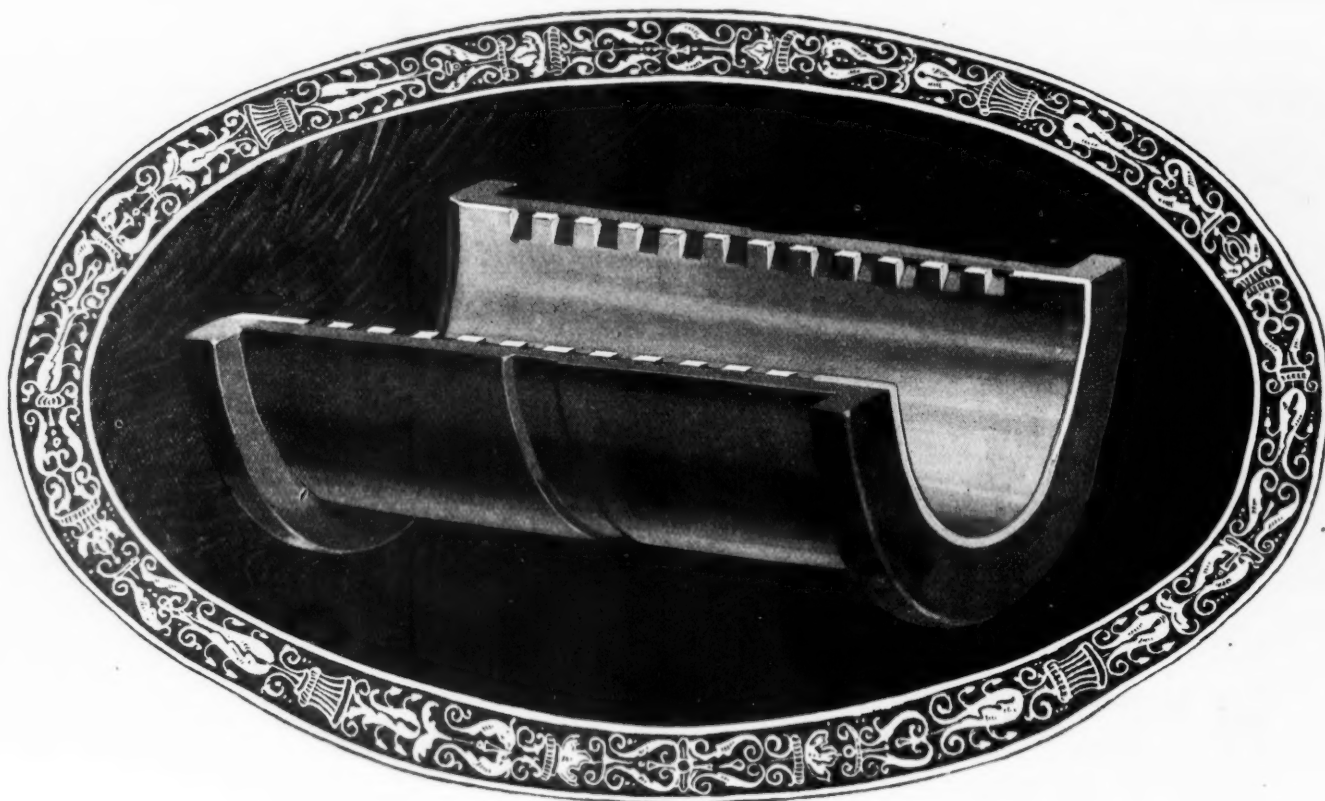


CROSLEY MODEL X-J

As an example of Crosley Radio Apparatus, see illustration of the Model X-J, a four tube, long range radio broadcast receiver, consisting of one stage of radio frequency amplification, detector and two stages of audio frequency amplification.

This is a wonderful set at a remarkably low price. Thousands have been sold. We make other receivers and a full line of parts. Catalog on request.

List prices on our equipment west of the Rockies 10% higher. In Canada add duty.



Winning Fame With Mogul Bearings

Muzzy-Lyon Company
Detroit, Michigan

King R. Rhiley, the champion driver who broke the Pikes Peak record in the most grueling test that bearings can be subjected to has written telling us how Mogul Bearings helped him do it.

"I wish to inform you that I have been using your high-grade Mogul bearings for the past three years in my Hudson and Essex racing cars, winning many other races besides National events. I won the annual Pikes Peak climbing classic in 1921, also first in my class in 1922 against factory entries and the world's noted drivers.

Mogul bearings have been a great factor in my success, assisting me to set a new record in 1921 over the highest highway in the world—Pikes Peak. My time still stands and was acknowledged by officials as being the fastest time ever recorded over this course.

I think that experienced engineers will agree that motor bearings are given a gruelling test in a race of this kind as it requires so much practice over a mountain road where the grades are from 20% to 40%, owing to the fact that these roads are cut out of the sides of the mountains and a driver absolutely must be familiar with his course. This is where Mogul equipment plays a great part in a race of this kind. After all these gruelling tests I did not experience one minute's trouble with my Mogul equipment, and I am very proud to recommend this high-grade Mogul Bearing."

(Signed) KING R. RHILEY.

MUZZY-LYON
COMPANY

Mogul
Engine Bearings and Bearing Alloys

DETROIT
MICHIGAN



A Gauge of Value by Which Case Asks to Be Judged

THE resale index printed below is taken from the National used car market report. It shows the average resale valuation—in 48 states—of seven of the most widely sold motor cars in the Case price class. The standard five passenger, open touring car is used as the basis of comparison:

CASE.....			SECOND		
Car A.....	First		Car D.....	Fifth	
Car B.....	Third		Car E.....	Sixth	
Car C.....	Fourth		Car F.....	Seventh	

(Names and actual valuation of these seven cars will be given on request.)

Above classification shows that Case is surpassed in national resale valuation by only one other car in its class. Yet, in Chicago, one of America's most competitive markets, Case exceeds this car's resale value by a margin of fifty dollars.

This eloquent testimonial of the basic worth of Case motor cars, shows conclusively that when old, as when new, Case cars give owners the greatest possible return on their investment.

Wouldn't you like to handle such a car as this? Aside from the profit end of it, there's genuine satisfaction in selling a product that gives a man the most for his money. This is one sure way of making a booster of every customer.

J. I. CASE T. M. COMPANY, RACINE, WISCONSIN



CASE

MOTOR CARS



THE SIGN OF MECHANICAL EXCELLENCE



FOR MORE THAN EIGHTY YEARS

USED IN
MANUFACTURING

USED IN
TOWING

USED IN
CONTRACTING

USED IN
MOVING

USED IN
BUILDING

USED IN
MINING

USED IN
FARMING

RE

The three Republic trucks which we have had for a little over one year have given us entire satisfaction. They are in use seven days a week and our repair bills to date on the three trucks have been less than \$100.00. These trucks are also economical in gas and oil which is an important item in truck operation.

Considering these facts, we heartily endorse the use of Republic trucks.

WEST SIDE DAIRY
Seattle, Washington



Yellow Chassis Truck

PUBLIC

New Assets

It is widely known that Republic has more trucks in use than any other maker of trucks exclusively.

And it is everywhere realized that the greatest advantages a dealer can be given consist of an absolutely complete line such as Republic offers; together with unusual factory service and sales co-operation.

Today there are added advantages, even, to make the Republic franchise so eagerly sought.

First, superiorities of construction point to still greater prestige. The engine, the axles, the

brakes, the drive controls, and other important parts are notably refined and more capable than ever. The lower operating costs and higher truck values of the improved Republic are unmistakable.

And now Republic administration is vigorous, dynamic—well seasoned by the best of the old Republic experience.

The improved Republic truck, Republic resources and personnel, are valued assets such as are rarely combined in a dealer connection. The facts about today's improved Republic are sure to interest you. Write or wire.

REPUBLIC MOTOR TRUCK CO., INC., Alma, Michigan
More Trucks in Use than any other Exclusive Truck Builder

USED IN
SHIPPING

USED IN
TRANSFERRING

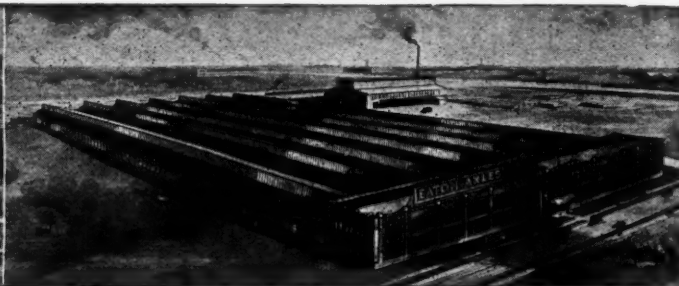
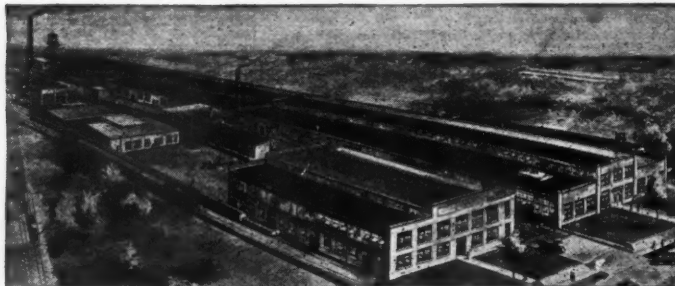
Transportation

USED IN
ALL FIELDS

USED IN
MILLING

USED IN
RANCHING

USED IN
DAIRYING



Why They are Better

EATON AXLES are exceptionally and uniformly good, because Eaton engineers are constantly striving to improve them, and rigid inspections make sure that the full value of each improvement is steadfastly preserved.

Our engineers have succeeded in designing axles that are both efficient and economical—axles notably free from trouble during years of constant use.

The men in our shops are trained and disciplined to work within unusually narrow limits of accuracy. They are aided by the newest plant, the latest and most complete equipment, now employed by any axle manufacturer.

We believe that Eaton Axles are better than others. And they do give wonderful service.

"Ask the Builders of America's Finest Cars"

The EATON AXLE & SPRING COMPANY

CLEVELAND

EATON AXLES



BUILT BY DURANT

The Durant

is a big merchandising
opportunity in itself—
but when coupled with

The Star Car

it makes a combination
rarely offered. Think
of *your* future—tie up
with a leader—get in
touch with the nearest
factory sales head-
quarters.

DURANT MOTORS, INC.

ELIZABETH, N. J.

LANSING, MICH.

OAKLAND, CALIF.

DURANT MOTORS OF CANADA, Ltd.

:-:

LEASIDE, ONT.

Going Over OLDSMOBILE - SIX

Read What Our Dealers Say—

Detroit, Oct. 1.—Public unanimous in favor of new Oldsmobile Six. At certain hours doors had to be locked to hold crowds back. Salesmen and prospects in show room until one o'clock Sunday morning. 17,378 visited the General Motors Building and local dealers' showrooms during Saturday, Sunday and Monday. Suburban dealers also report big attendance.
Detroit Branch

St. Louis, Mo., Oct. 1, '23.—Model 30 enthusiastically received by dealers and public. Over 1500 people visited our Salesroom since Sunday morning. Closed many new dealer contracts today.
Phil Brockman

San Francisco, Cal. Oct 1, '23.—Oldsmobile reception exceeds all expectations. Nearly 2500 people accurately checked in since cars put on display. Many orders taken and prospects are wonderful.
J. W. Leavitt & Co.

Atlanta, Ga. Oct. 1, '23.—600 visitors by actual count have visited our showroom up to three-thirty P. M. Estimate 1000 for the day. The public simply staggered at the values and price.
Atlanta Branch

Columbus, O. Oct. 21, '23.—Reception given Model 30 at our opening day exceeds all expectations on first day. Total attendance estimated 2000.
Moyer Oldsmobile Co.

Phoenix, Ariz. Oct. 1, '23.—Announcement of new Model greatest success ever experienced. All enthusiastic over new production.
Snow & Tufts Auto Co.

Boston, Mass., Oct. 1, '23.—Model 30 receiving greatest reception ever accorded a new Oldsmobile in Boston. Biggest day we ever had.
Boston Oldsmobile Co.

New York City, Oct. 1, '23.—Our new closed cars received greatest reception of any at closed car show. Oldsmobile Booth had more people in it than any exhibit at show. Interest shown by all assures the future of Oldsmobile. Will positively be in third place in industry within year.
C. H. Larson

Cleveland, O., Sept. 30, '23.—Model 30 accorded enthusiastic reception by Cleveland public. More than 1000 people visited our salesroom today. The new car a wonder and the greatest value in the market today and a truly great achievement.
Simmons Motor Car Co.

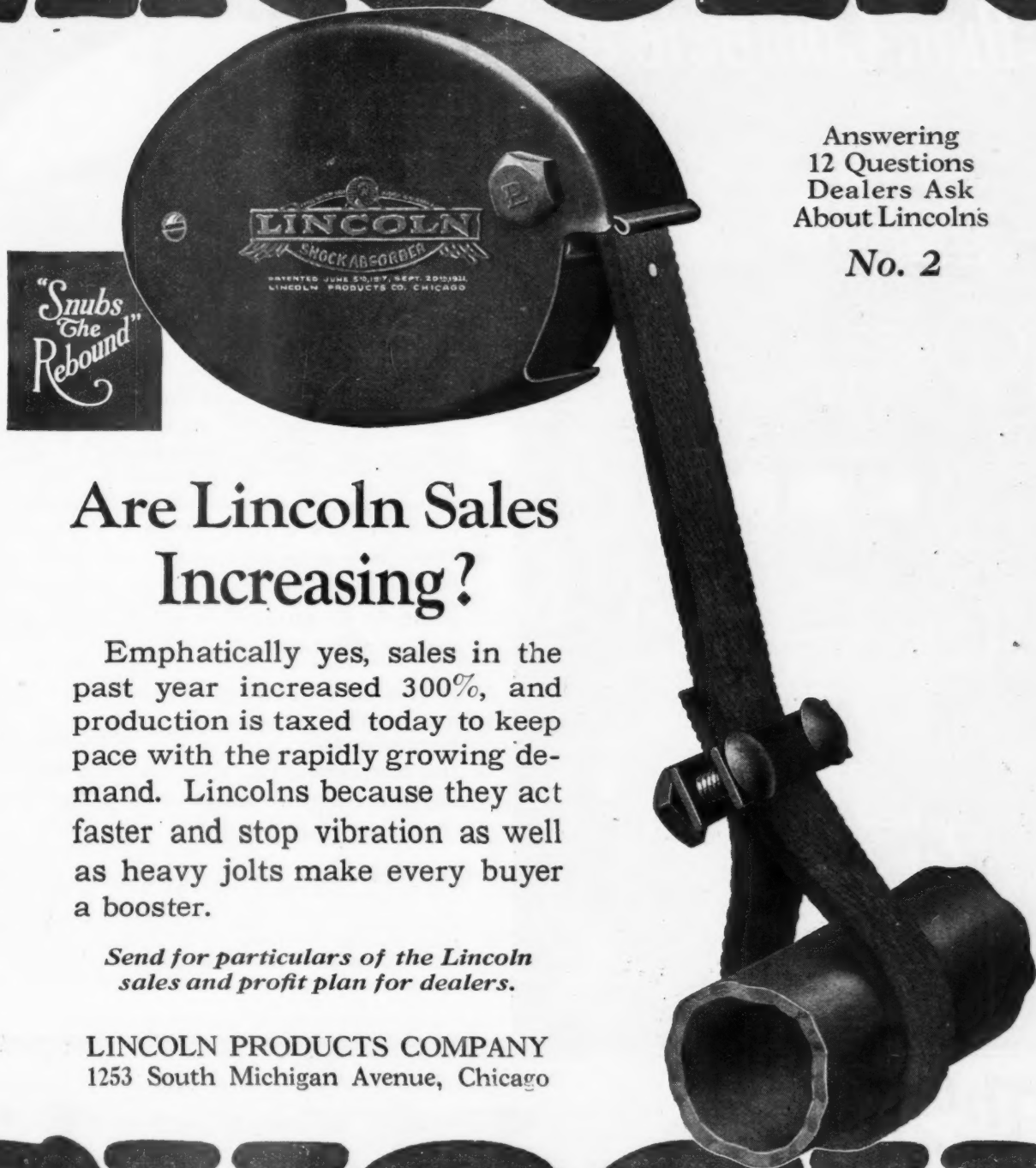
Indianapolis, Ind., Sept. 30, '23.—New car a complete "knock-out." 2745 people by actual recording called in to see new car first twenty four hours.
Lathrop-McFarland

The Wires Show that the Public is Ripe for—

a **SIX** at
\$ **750**

OLDS MOTOR WORKS, LANSING, MICHIGAN
Division of General Motors Corporation

LINCOLN



Answering
12 Questions
Dealers Ask
About Lincolns

No. 2

Are Lincoln Sales Increasing?

Emphatically yes, sales in the past year increased 300%, and production is taxed today to keep pace with the rapidly growing demand. Lincolns because they act faster and stop vibration as well as heavy jolts make every buyer a booster.

Send for particulars of the Lincoln sales and profit plan for dealers.

LINCOLN PRODUCTS COMPANY
1253 South Michigan Avenue, Chicago

SHOCK ABSORBERS

It's Easier to Sell the Brand New Oakland than Compete with it!



\$1195



\$1345



\$1395

Brand New Engine Four-Wheel Brakes New Fisher Bodies New Lower Prices

Since the announcement of the Brand New Oakland on September 8th, there have been hundreds of requests from dealers for Oakland franchises.

On scores of occasions, these dealers have remarked that this fine new car, and the rousing reception it is receiving everywhere, proves to them that it is going to be an easy seller and dangerous competition.

If you have not already done so, it will most certainly pay you to find out if your territory is open and to get *all* of the convincing facts which are attracting the best of dealers everywhere to the True Blue Oakland.

New Low Prices

Touring Car	- \$ 945	Roadster	- \$ 945
Sport Touring	- 1095	Sport Roadster	- 1095
Business Coupe	- 1195	Coupe for Four	- 1345
Sedan	- 1395	All prices f. o. b. Pontiac	

**The
True
Blue**

Oakland "6"

OAKLAND MOTOR CAR CO., PONTIAC, MICH.
Division of General Motors Corporation



"THAT REMINDS ME"

AND it will remind every autoist of his oil supply when he drives up for gasoline. It will do more. The convenience, the quick service secured, the different grades of oil to select from—everything right at hand—will cause him to *fill up* his oil chamber *then* even tho it is *not* empty. The dealer will sell *many times* the amount of oil—and oil pays a *good profit*.

American Visible Lubricating Outfit

Oil flowing by gravity is *slow*—in cold weather it is *slower*. In the American Lubricating Outfit the pump *forces* the oil into the measure, filling it in one or two seconds instead of minutes.

There is *no dripping* from the spout — our anti-drip nozzle is patented and used *exclusively* on our equipment. This nozzle not only prevents dripping but is a *big saving* of expensive oil—a saving that more than *pays for* the outfit in a few months' time.

This outfit, set alongside an American Visible

Gasoline Pump, gives the motorist *quick, unequalled* service that is appreciated and *reflects credit* on the dealer. It secures the motorist's confidence, he likes the service and he will come again.

Competition among filling stations is increasing. *Quick service* and *square dealing* attract the *biggest volume* of trade. The American Visible Gasoline Pump and the American Visible Lubricating Outfit *give both*.

American equipment insures *maximum business*. Write for prices and full information.

The American Oil Pump & Tank Company

1159 FINDLAY STREET,

CINCINNATI, OHIO



"A Life Preserver for Every Motorist!"

That's what thousands of car-owners say of Basline Autowline. And it is like a life preserver—not thought about until needed, and then you simply can't get along without it.

No matter what happens—engine trouble, a skid into a ditch, or whatnot—Basline Autowline is *tow-home insurance*! You simply hail the first passing car—hitch on behind—and in a jiffy you're on your way. Get one this week.

Don't buy "just a towline." Insist on dependable Basline Autowline—the *original* wire rope towline. Made of world-famous Yellow Strand Wire Rope. Handy, light, coils up flat and fits under your seat cushion. Has patented Snaffle Hooks. And only \$4.95, east of the Rockies. Don't put off buying this real necessity—this "Little Steel Rope with the Big Pull."

Money for Jobbers and Dealers:

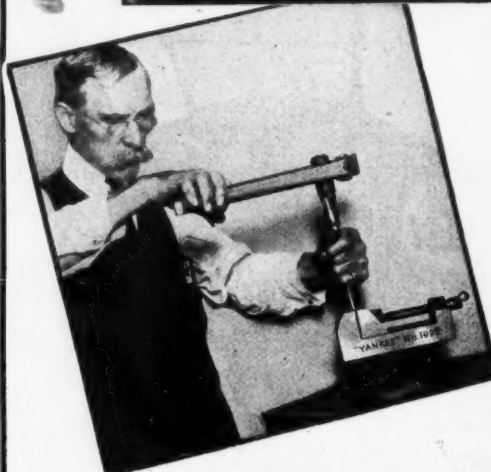
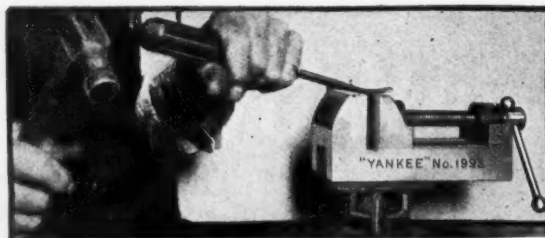
Basline Autowline pays you a good profit, it sells well, and is the **ONLY** Nationally-Advertised towline on the market. Push it this season.

BRODERICK & BASCOM ROPE CO.
ST. LOUIS — NEW YORK



BASLINE AUTOWLINE

GR 191



"YANKEE"

Plain Screw-drivers
stand abuse as well
as hard use.

A screw-driver is the most abused tool in a busy mechanic's kit—and "Yankee" Plain Screw-drivers are specially constructed to meet this condition.

No matter how you misuse "Yankee" Plain Screw-drivers, the blades won't turn or loosen in the handles. An ingenious "Yankee" device makes them virtually one-piece tools.

The steel in the blades is specially tempered and won't chip, bend, twist, break, or turn edges.

Look at the tests pictured above. At top, a "Yankee" No. 90 is chipping off a strip of steel without injuring blade. Lower picture shows how blade remains rigid in handle despite powerful twist.

Some other "Yankee" Tools

Ratchet Hand Drills	Ratchet Tap Wrenches
Ratchet Breast Drills	Bench Drills
Ratchet Chain Drills	Automatic Feed Vises, Removable Base
Ratchet Screw-drivers	Spiral Screw-drivers

Dealers everywhere sell
"Yankee" Tools

NORTH BROS. MFG. CO., Philadelphia, U. S. A.

"YANKEE" TOOLS

Make Better mechanics



No. 90—Standard Style
—15 sizes—1 1/2 inch
to 30 inch blades,
No. 95—Cabinet Style
—11 sizes—2 1/2 inch to
15 1/2 inch blades.



Helpful Tool Book Free

Illustrates and describes all
the ingenious "Yankee"
Tools for saving the me-
chanic's time and labor.
Send postal today.



*Reproduction of an Advertisement
Appearing in The Saturday Evening
Post of October 13, 1923*

The Sweetest Tooth

America has the sweetest tooth in the world.

Our total candy consumption for 1922 was 1,250,000,000 pounds—625,000 tons!

For this prodigious assortment of sweets, temptingly molded into a myriad shapes and sizes, we paid five hundred million dollars.

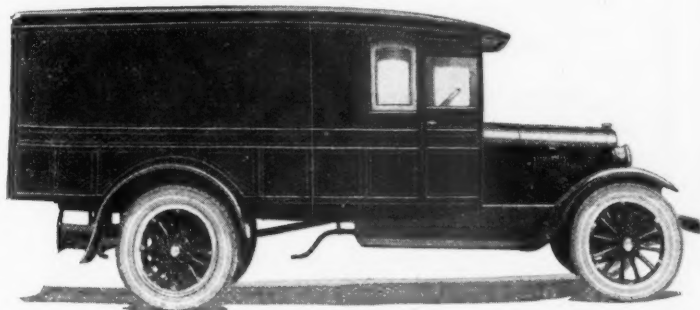
Chief of the several ingredients which give candy its wholesomeness and delicious flavor, is sugar. The amount used in one year by the 2150 major candy manufacturers was 625,000,000 pounds.

In keeping with the growing dignity and importance of their business, candy manufacturers and jobbers everywhere are standardizing on the most attractive and dependable trucks. Graham Brothers Truck, in particular, is meeting their requirements in an admirable way. Its appearance commands instant respect—and its performance, as demonstrated in 343 different lines of business, surpasses all expectations of the most exacting owners.

*1 Ton Chassis, \$1265; 1½ Ton \$1325;
f. o. b. Detroit or Evansville, Ind.*

GRAHAM BROTHERS
Detroit — Evansville

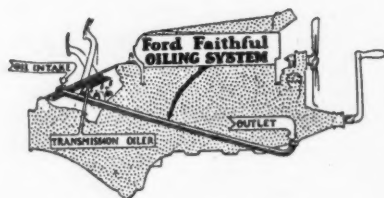
*Graham Brothers Truck
—as recently improved
—with standard panel
body for candy manu-
facturers and jobbers.*



GRAHAM BROTHERS TRUCKS

SOLD BY DODGE BROTHERS DEALERS EVERYWHERE

It Satisfies—



Every Automobile Accessory Dealer knows the value of the customer who is satisfied. Not only does he return again for other purchases, but he sends his friends in for any accessory which has given him good service.

As a builder of more sales, the FORD FAITHFUL OILING SYSTEM has firmly established itself. It sells quickly, meets a much needed requirement, and delivers the goods. It will end burnt out bearings, scored cylinders, and big repair bills by thoroughly lubricating the Ford motor. It has proved itself a Boon to all Ford drivers.

There has never been a better time for stocking this accessory. It sells on its merits once the public learns about it. And the extensive advertising campaign now under way will take care of that angle. Get your information now about quantity discounts.

The Ford Faithful Oiling System is fully covered by basic patents. Infringers will be prosecuted to the full extent of the law.

W.O. Thompson Mfg. Co.
 330 Mountain View St.
 Pasadena California

NO CONNECTION WITH FORD MOTOR CO.

Selling trucks and buses is easier when you know the owner's viewpoint

Read Motor Transport

It tells you the problems of the Fleet Owner. It tells you how Fleet Owners are making and can make a success of truck or bus operation.

Just as *Motor Age* tells you how to handle your business, so *Motor Transport* tells how to efficiently operate fleets of motor trucks and buses.

Reading *Motor Transport* will make you a better dealer.

Recommend fleet owners to whom you have sold trucks or buses to subscribe for *Motor Transport*. This magazine will make them more efficient operators.

You will both benefit!

Motor Transport is published semi-monthly, on the 1st and 15th. The subscription price is \$2.00 per year (\$2.50 West of the Mississippi).

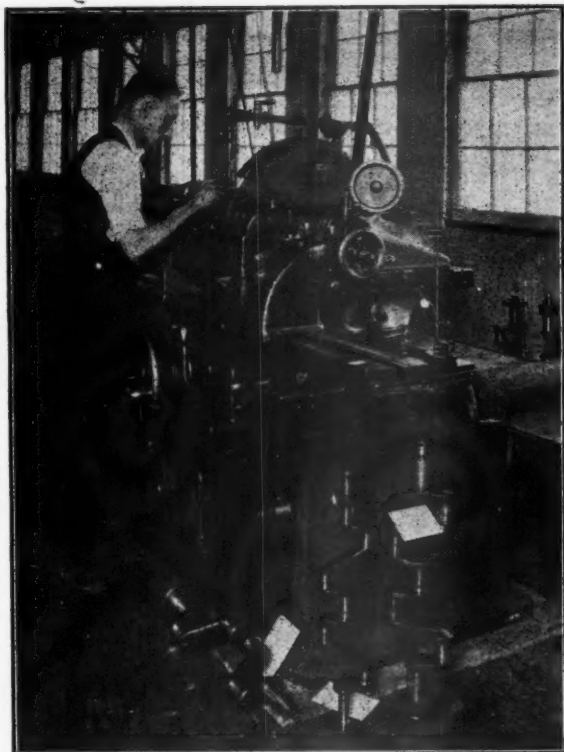
Write for a sample copy.

**Motor
Transport**

FORMERLY COMMERCIAL VEHICLE

(Published by the Class Journal Co.)

239 West 39th St. New York, N. Y.



Success in the RE-GRINDING Business

The prospects for a first-class shop in each community to take REAL care of re-grinding work were never so bright. But success in this business, as in any, will depend upon the kind of equipment you have.

If a little more time must be taken with each job, if extreme expertness is required of the operators, if repairs and re-adjustments to the machine are frequent, overhead charges will largely offset profits.

On the other hand, if you begin with equipment **ESPECIALLY DESIGNED FOR THE RE-GRINDING SHOP**, you can be on the black side of the ledger, almost from the very first.

The **LANDIS 4-A SPECIAL GARAGE GRINDING MACHINE** is unmatched for crankshafts, pistons, pins, king-bolts, etc., etc.

—whatever needs grinding. Built especially for automotive service work—not manufacturing.

The **LANDIS CYLINDER GRINDING MACHINE** is especially well suited for re-sizing work. Nothing complicated like some machines with their 10 to 12 speeds — the Landis has but 2 traverse speeds, 2 eccentric speeds, 2 spindle speeds. Comes **COMPLETE**, ready to tackle any regular job without putting you to the expense of extras. Hundreds in use—making good, every one.

These grinding machines represent the highest refinement of design and construction, by the largest grinding machine manufacturer. High grade machines—high grade **SERVICE**. You will be **MORE THAN INTERESTED** when you compare Landis **PRICES**. Catalog upon request.

LANDIS

LANDIS TOOL CO., WAYNESBORO, PENN.

New York Office: 30 Church Street



Collect on Free Air

*You can do it
with the help of a
Franklin Air and
Water Station*

Many a man has grumbled at the cost of compressing air for free distribution at the curb. But free air brings customers, particularly if it is served up by a Franklin "clean-hands" Air and Water Station. It stands out front like a welcome handshake to the customers who otherwise would roll by.

The patented Franklin outfit is built for long, hard service. There is nothing to get out of order—no springs to turn rusty or lose their tension. The head revolves, and with the long hose arm and air hose it is an easy matter to reach two cars at the curb without moving them. The hose arm is counter-balanced, so that it drops back into position when released. The head is glass-encased and wired for an electric light; at night it stands out as the place of real air and water service. In the day time its attractive appearance stops automobile drivers. It comes in gray and black and stands 12 feet, 6 inches overall. A man turns the non-corrosive brass valve and he has water; he runs the long air hose to his tires and he has air—quick, convenient!

The Franklin Air and Water Station is a go-getter for business. It saves time for your customers and time for you—your men don't have to run around with the old water bucket and air machine. Order yours from your jobber today, or write us.

\$58⁵⁰ f. o. b.
Norristown

**Franklin
Air Compressor Works**

2604 Main Street

Norristown, Pennsylvania

Manufacturers of the Franklin Air Compressor



Put up in packages that sell quickly

*Neat, dust-proof packages of 100 feet each—a
length that meets all average requirements.*

Each package properly marked as to size, type and quantity. These packages encourage motorists to stock up a hundred feet, where before they would buy short lengths—enough to satisfy their immediate requirements.

That's why Goodrich Starting, Lighting and Ignition Cable sells quickly.

This method of merchandising banishes the bulky, dirt-collecting reels that are destined to be obsolete—same as the old-fashioned parts and accessory bins that have been replaced by attractive, quick-selling cartons and packages.

The new Goodrich way permits the dealer to carry a complete stock of assorted types and sizes—and keeps it moving all the time.

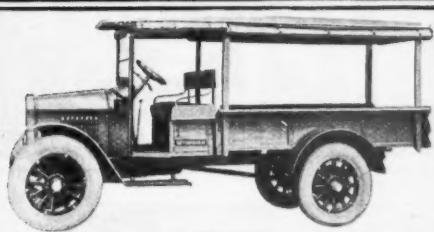
Goodrich Cable is 100% dependable, because it is so carefully built of the very best materials available.

We make a complete line of wires and cables for all classes of motor-driven vehicles, including a variety of special sizes and types—suitable to meet every need.

JOBBER: We have catalogue insert pages, electrotypes, counter literature, sample outfits, for salesmen and other sales helps for your use.

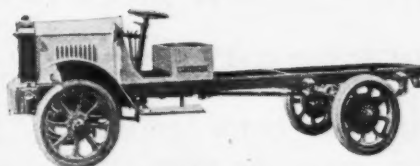
THE GOODRICH-LENHART
MANUFACTURING CO.
Hamburg, Pa.

Goodrich
AUTOMOTIVE EQUIPMENT
Cable
Starting-Lighting-Ignition
Formerly M.P.



"AIRLINE"
One Ton Chassis
\$1385.00

The
New



"FAST FREIGHT"
Two Ton Chassis
\$2185.00

BETHLEHEM

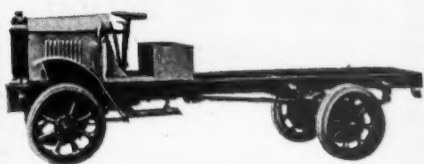
For 1924 — New in Everything

New in Design, New in Sales Policy, New in Management and Personnel

A magazine oiling system, electric starting and lighting, double reduction axles running in oil, heavy chrome vanadium steel springs, positive action brakes, ignition by Bosch AT Truck type magneto — New selling points most convincing.

A Dealer's contract which allows the dealer to determine his selling possibilities before obligating himself with a delivery schedule. Contracts automatically renewable year after year made direct with the factory — a new selling policy.

The New Bethlehem Corporation is new in control, in management, in policy and in product



"HEAVY DUTY"
Three Ton Chassis
\$2985.00



**THE NEW
BETHLEHEM MOTORS CORPORATION**

OF NEW YORK

ALLENTOWN

PENNSYLVANIA

You can sell more accessories—why don't you?

Profits on motor accessories depend largely upon the proper merchandise—plus sales compelling display.

By putting your accessories in a

SHERER ACCESSORY DISPLAY CASE

you not only display them effectively but you speed up sales, increase turnover and build up a permanent profit. This silent Sherer salesman holds and displays everything—from bumpers to spark plugs. It makes them all sell easily. The additional profit you make pays for it within a very short time.

A Double Purpose Case—

The Sherer Accessory Case shown below serves as a display case and has storage space for your merchandise.

Saves you time and profit and many useless steps in selling.

Write in today for our catalogue A. It explains "Silent Selling with a Sherer."

SHERER-GILLETT CO.

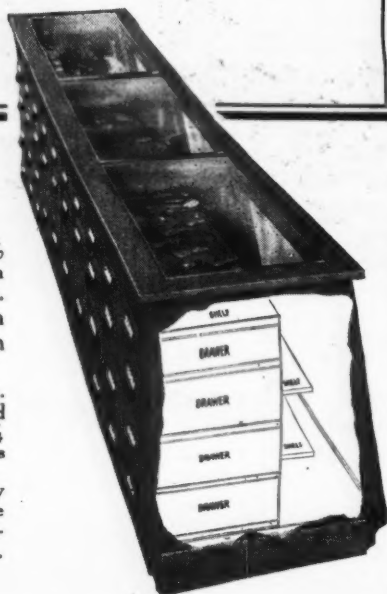
17th and Clark Sts.

Chicago

50% More!

Notice how you get 50% more display surface than in the ordinary show case. Notice how you have room to store merchandise in the big drawers.

The drawers are 14½ in. long and 11⅞ in. wide and are in three depths—3¾ in., 7 in. and 15⅝. Takes all kinds of accessories. Sherer Accessory Display Case is furnished in three standard lengths as follows: 8 ft. 8 in.—12 ft. 2 in.—15 ft. 10 in.



10 BIG FEATURES CIRCLE S

Automatic Windshield Cleaner



List
Price
\$5.00

Its Low
Selling Price
Means Volume
Sales

Five minutes of explanation will sell a "Circle S" to nine out of every ten car owners who enter your store. Its ten big exclusive features and fool proof mechanism appeals to the common sense of the motorist and its low price appeals to his pocketbook.

"Something for the Car for Christmas"

Write Us Today For Details & Discounts

F. W. STEWART MFG. CORP.

356 W. Huron Street,

Chicago, Illinois

Manufacturers of the well known "Circle S" Swivel Joints.

**DE LUXE
Products**



**Eager for action
when
action's required**

Only \$3.50 Retail

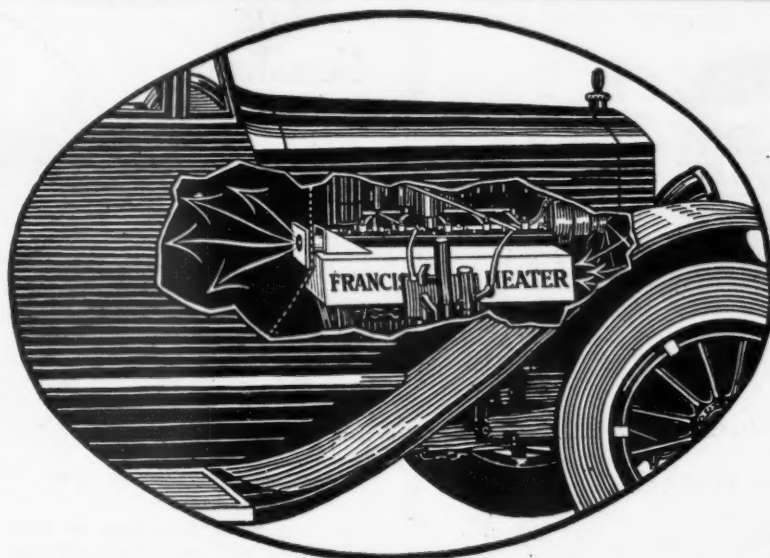
**ORDER DIRECT
SPECIFYING
JOBBER**

The
DeLuxe
TIRE PUMP

Also
ARVIN HEATERS
DE LUXE,
DE LUXE VENTILATORS

**INDIANAPOLIS PUMP & TUBE CO.
INDIANAPOLIS**

Has been
Adopted as
Equipment by
Packard
Maxwell
Chalmers
Lexington
Stutz
Columbia.
Is being used
as standard
equipment on
the Ricken-
backer open
and closed cars.



List
prices
of our
heaters
are from
one-third
to one-half
the prices
of other
exhaust
heaters
on the
market

Winter Driving in Comfort

The Francisco Auto Heater will make your customer's car as comfortable as his living-room. It causes fresh, warm air to circulate through the car, creating an even temperature in front and back seats. The heat is produced after driving four or five squares and at the low speed of 10, 15 and 20 miles per hour, as well as high speed. Simple in construction, it can be installed in an hour's time. Over sixty different models are manufactured, furnishing the dealer a complete line for very make of popular car. We will be glad to quote dealers' discounts promptly.

Address Dept. A-1

Francisco Auto Heater Manufacturing Co.
COLUMBUS, OHIO



ALIGNING FIXTURE

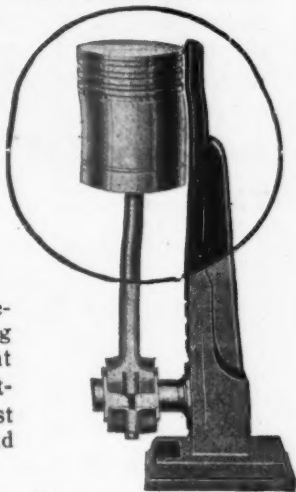
SIMPLE - POSITIVE IN DESIGN IN ACTION

The simple construction and micrometer accuracy of the Eagle Aligning Fixture gives you a combination that enables you to turn out satisfactory overhaul jobs in extra-short order. There's nothing to get out of order about the Eagle or the five patented adjustable bushings that go with it.

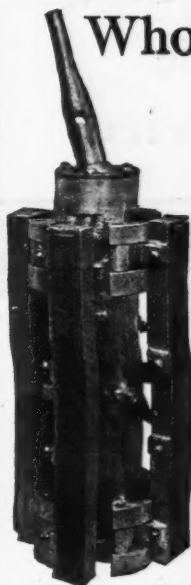
In shops where quick, accurate repairs are made the Eagle Aligning Fixture has proved itself efficient and economical. Soon pays for itself in time saved in proving wrist pins, bushings, connecting rods and pistons.

Order through your jobber or
write us for detailed information.

EAGLE MACHINE CO.
24 N. NOBLE ST., INDIANAPOLIS



Who Gets the Money?



THE man who takes out the motor block sends it to the grinder, keeps his customer waiting and his floor occupied—or the man who uses Hall's Cylinder Hone on the usual reconditioning job?

The Hall Hone takes care of the usual taper up to .007". Does the work right on the chassis, saves time and makes a big profit possible within the flat rates.

The Hall Cylinder Hone has two features that especially appeal to good mechanics. The stones expand by equal pressure to an equal diameter. They do not follow an oval. They are also hinged top and bottom to maintain a rigid parallel. They cannot tip or follow a taper.

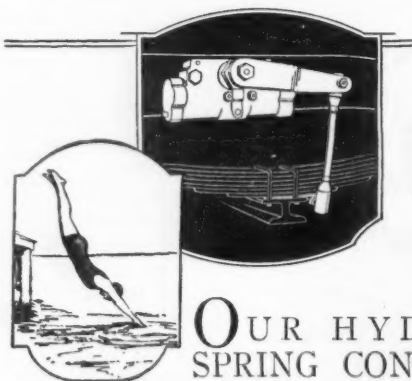
Consider Hall's Cylinder Hone at \$50 and the bigger, better and more profitable work it will enable you to do.

Buick engineers have O. K'd and recommended Hall's Cylinder Hone for use in all their branches. In stock at all leading jobbers.

**THE HALL CYLINDER HONE
COMPANY**

435 DORR ST., TOLEDO, OHIO





*The Fluid
Absorbs
The Shock*

OUR HYDRAULIC SPRING CONTROL, with its dual valve system, not only stays sold in the hand of the customer, but the customer BECOMES A BOOSTER.

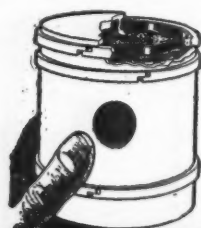
Hence our franchise not only brings profit, but HELPS YOUR OTHER BUSINESS by making pleased and satisfied customers.

Desirable territory still open. Write.

**AUTO SPRING
CONTROL CO.**

Jamestown
New York

**2WAY
HYDRAULIC
SHOCK
ABSORBERS**



**Double Sales
at the
20c Price**

**GENUINE
APEX INNERINGS
(INSIDE PISTON RINGS)**

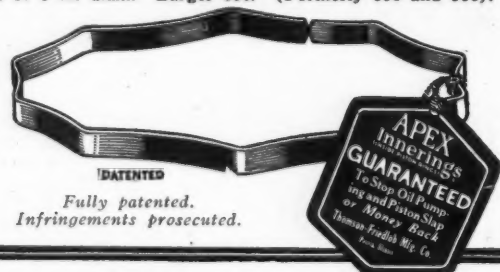
have always commanded a quick, easy turnover as is proven by the millions now in use to

STOP OIL PUMPING and PISTON SLAP

fouled plugs, vibration and excessive gas and oil consumption—and to renew compression, power, silence and economy of operation for all types of gas engines. **REBORING UNNECESSARY.**

Now, at the 1/3 reduced price, it is easy to double sales on this only successful, genuine Innering, that is guaranteed to jobber, dealer, and user alike. Auto, truck, tractor and all other gas engine drivers and owners buy them on sight.

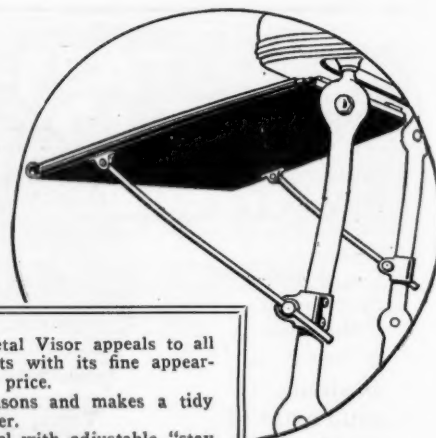
DEALERS: Order now from your jobber or write us. **JOBBERS:** Get our attractive new discount today. Retail Price Only 20c Each, up to 3/4 in. wide or 5 in. diam. Larger 35c. (Formerly 30c and 50c).



Patented.
Fully patented.
Infringements prosecuted.

THOMSON-FRIEDLOB MFG. CO.
Peoria, Dept. C, Illinois

**For
Sunshine
or Storm
in all
Seasons**



The Higgin all-metal Visor appeals to all classes of motorists with its fine appearance and popular price.

It sells in all seasons and makes a tidy profit for the dealer.

Made of sheet steel with adjustable "stay put" brackets. Finished in baked enamel—black outside—green inside. A gutter on the lower edge drains water over the side. Made for all cars including Fords.

Our selling plan gives you protected territory and real selling assistance. Write for it.

THE HIGGIN MFG. COMPANY

Automotive Division, Newport, Ky.

**HIGGIN
ALL-METAL
VISOR**

*Installed with a
screwdriver in
twenty minutes
on open or
closed cars.
Strongly made.
Cannot rattle,
flop, tear or
crack.*

Sells for

\$3.50

and nets a
big profit.

BELL Profits Are Permanent

because there are no "comebacks" to Bell Timer sales. And every customer tells his Ford owner friends about the super-service rendered by this unusual timer.

Bell Timers don't stay on your shelves—they turn over with a speed that will surprise you. Show them on our unique "Heart of the Ford" display stand and they'll sell even quicker. Free with your order for 10 or more Bell Timers.

The BELL Timer

The Best to Sell

The Best to Buy

Sure-fire, accurate. Durable Bakelite shell cannot leak or short. Copper brush and contacts, with unbreakable steel spring ensuring constant, even pressure. Wipe contact. No oiling or attention. Ford owners know that Bell ends timer troubles. Are you one of thousands of dealers busy supplying the growing demand?

Sold through all leading jobbers

Attractive Dealer Discounts

Bell Manufacturing Co.
13 Elkins St., Boston 27, Mass.



List
Price
\$3.

Every "STOP" Light needs this Switch



Price
50
cents

—bound
to sell fast

Car owners will buy Elm City No. 50 Switches just as fast as they learn about them.

For an Elm City No. 50 will make any "STOP" signal work.

Dealers like to handle it because it is popular and sells fast.

Water, dust and rust proof. Mechanically perfect. Absolutely guaranteed.

Get the details.

Jobbers

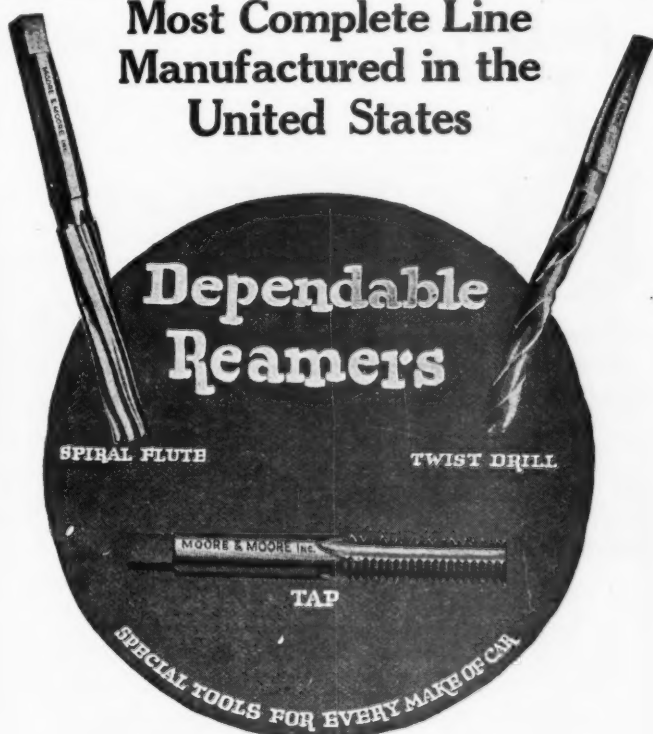
Dealers

Every STOP light owner is a prospect. You will be interested in our special trade offer—and discounts.

The C. S. Mersick & Co.

274 State Street, New Haven, Conn.

**Most Complete Line
Manufactured in the
United States**



Moore & Moore, Inc.

Reading, Pa.

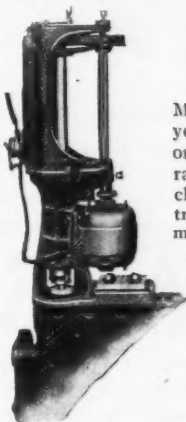
The Only Portable Machine That Both Rebores and Grinds Cylinders

Results equal the work of large stationary grinders costing five times as much, yet weighs only 195 pounds.

New Model "B" with 1/2 H. P. Motor and many other improvements.

Simplicity

**Portable Cylinder Grinder
With Boring Attachment**



Pat. Mar. 16th, 1915, May 11th, 1920, other patents pending.

Many garages have doubled their profits in one year with a Simplicity. Not only means profits on cylinder work but brings other business—raises your standard in the community as a mechanic. Also used by owners of bus lines and truck fleets. One out of every five automobile motors were either ground or rebored last year.

Profits of \$850 to \$4,000 and more

are possible in a year. Hundreds already in use—a proven product. Bore all sizes of cylinders from 2 3/4" to 5 1/16". Boring bar runs 37 R. P. M. operated by train of gears; grinding spindle runs 5,000 R. P. M. driven from belt by gear driven pulley. Motor operates under all field conditions—any current. Any mechanic can operate it.

We Sell You a Business

With the Simplicity goes handsome indoor and outdoor signs, printed circulars, movie slides, cuts for your local newspapers—everything to start profits coming at once. Satisfaction Guaranteed.

Simplicity Engine & Mfg. Co.

Dept. C

Port Washington, Wis.

"WHITNEY"

LONG SERVICE **CHAINS** HIGH MILEAGE
SILENT TYPE

Never Skip the Sprocket Teeth



Unrivalled for Great Mileage

THE WHITNEY MFG. CO.
HARTFORD, CONN.

New York	Boston	Philadelphia
L. C. Biglow & Co., Inc.	George C. Steil,	R. J. Howison
243 West 55th Street	200 Devonshire Street	624 Race St.
San Francisco, A. H. Coates Co., 770 Mission St.		

MARVEL Prize Contest

AN announcement of a prize contest will appear in the November 1st issues of Motor Age and Motor World. The contest will be based on our page advertisement which appeared in Motor World October 18th. Save your copy of this issue.

Motor Equipment Manufacturers, Inc.
33 West 60th St. New York, N. Y.

PARANITE CABLE

Best for Automotive Work

We carry at all times a complete stock of every kind of cable used for automotive work. Many years of specialization have brought **PARANITE** Cables to the highest state of perfection. The finest grades of rubber compound, cotton and flexible enamel varnish are used.



FOR 33 YEARS THE STANDARD
IF IT'S PARANITE IT'S RIGHT
Quality jobbers handle quality cable—that's **PARANITE**.

Indiana Rubber & Insulated Wire Co.
810 Marquette Bldg., Chicago
Factory and General Offices—Jonesboro, Ind.

Four Shops Out of Five

Lose the extra money of cylinder work—jobs that can often be done just as they stand—right in your own shop—at bigger profit with faster service—by using a

STORM HONE

Complete and with extra equipment for fast cutting only \$40.25. Instant adjustment for all cylinders from 2 3/4 to 8 in. Simple and sturdy. The deep, heavy, wide faced stones on the Storm Hone means longer life, faster cutting and smoother finishing. Send for the Storm Book that tells how to make bigger money on cylinder work with a Storm Cylinder Hone.

STORM MFG CO

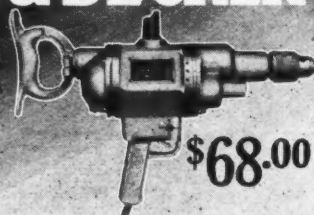
406A Sixth Avenue, South,

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BLACK & DECKER

SPECIAL
HALF-INCH
DRILL

"With the Pistol Grip
and Trigger Switch"



\$68.00

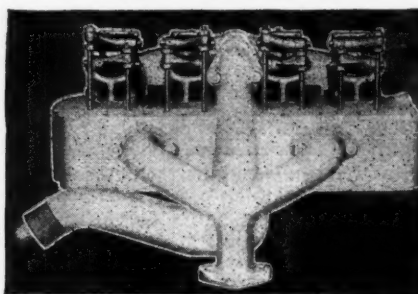
The BLACK & DECKER MFG. CO.
TOWSON, MD.

New Departure Ball Bearings



ROOF 16 OVERHEAD VALVE EQUIPMENT

For Ford and Dodge Motors
ROOF 8 VALVE HEAD FOR FORD MOTOR



Stupendous Power—
Lightning Speed

Ford racing cars with Roof Equipment are rivals on mile and one half mile tracks of the highest priced racing cars. Doubles the pulling power of the Ford or Dodge pleasure car or truck. Hill climbing and general road work beyond wildest dreams of the owner. Complete—ready for installation—no machine work necessary. We are headquarters for all speed equipment. No matter what you want, write us. Racing quality—lowest prices. A postal card brings you complete list of our specialties.

Jobbers—Dealers—Consumers—Write Us
THE LAUREL MOTORS CORPORATION, ANDERSON, INDIANA

FOLLETT'S NEW MODEL TIME STAMP

—accounts for every labor minute

Prints the year, month, day, hour, minute, A. M. or P. M. at the exact moment the plunger is pressed—like this, for example:

NOV 19 1920 4 31 PM



Learn the interesting details from our descriptive data.

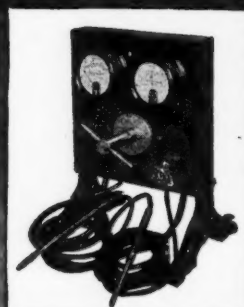
Tells when a job is started—and when it is finished. There can be no dispute over the time charge.

Absolutely automatic—except for winding. Special machines, with as many as six different words, can be made. Every machine guaranteed.

Follett Time Recording Co., 7 West Broadway, New York City

ACE HIGH-RATE BATTERY

TESTER shows voltage drop and ampere draw



Inspires Confidence

Shows your customer in a positive way when his battery needs repairs or should be replaced with a new one. In addition to profit it adds to the appearance of your shop and inspires confidence in your ability.

Price \$39.50

F. O. B. CHICAGO

Voltmeter and ammeter, precision type, 4 inch diameter, sapphire jewelled. Variable carbon rheostat—0 to 600 amps.

ORDER FROM YOUR JOBBER

WEIDENHOFF 4322 ROOSEVELT ROAD
CHICAGO, ILL., U.S.A.



SAFETY Front Wheel Brakes

Can be attached to ANY MAKE of car. Wonderful overhaul opportunity as every motorist wants to be up-to-date. Operates from the regular brake-pedal. Permits any car to stop in less than HALF THE DISTANCE required with rear wheel brakes alone. Safety feature appeals to all—especially women-drivers. Absolutely no danger of skidding.

Don't pass this up. It is one of the biggest money-making opportunities you will have this year. Write us NOW about this. Big discounts.

GREEN ENGINEERING COMPANY

740 MAIN ST., DAYTON, O.

Distributors for Front Wheel Brakes only. H. F. Morgan, Tampa, Fla.; Reid Air Spring Sales Co., Pittsburgh, Pa.; Clarion Buick Co., Clarion, Pa.; Kittanning Buick Co., Kittanning, Pa.; F. L. Wirick, San

Pedro, Cal.; Walker Auto Supply Co., New Kensington, Pa.; John J. Schiffmacher, Brooklyn, N. Y.; John B. Mezey, New York City; McCarthy Bros., Inc., Philadelphia, Pa.

SAVE TIME WITH *The Cincinnati* "Junior"

$\frac{1}{4}$ " PORTABLE ELECTRIC HAND DRILL
BALL BEARING - - WEIGHT 5 LBS.



PRICE **\$28**

Pistol Grip with Automatic Switch. Mandrel with emery wheel or buff for light grinding and polishing. Bench base with clamp for holding drill for above work.

$\frac{1}{2}$ " "Special" Drill

BALL BEARING - - UNIVERSAL MOTOR



PRICE **\$65**

Powerful, durable, compact. Combination Bench Drilling Stand for use with this drill.

A complete line of Portable Electric Drills, Grinders and Buffers. Send for Catalog.

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50 Church St.	1115 Federal Ave.	Philadelphia
San Francisco		1220 Real Estate Trust Bldg.
918 Hearst Bldg.		Los Angeles
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For over sixty makes of cars and trucks in general use today, Walden-Worcester has Service Selections of Socket Wrenches—each selection especially adapted for particular parts of the particular car for which it is designed.

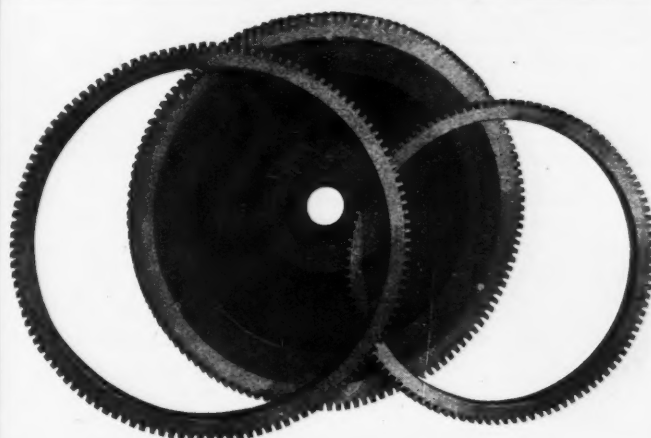
Your Jobber can supply you with any or all Selections from his stock. Write him.

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Incorporated

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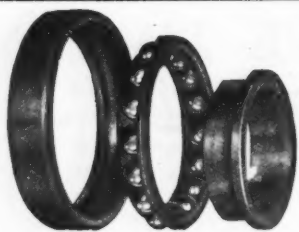
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New Low Prices On Fly Wheel Rings

Increased quantity production has enabled us to get out a new and lower price list on Meachem Steel Gear Rings for Fly Wheels. Also our trade discounts have been increased to more than offset the lower list prices. Write us for the new list and discounts.

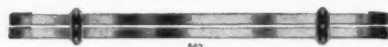
The Meachem Gear Corp'n.
Ring Dept. Syracuse, N. Y.



Angular Contact Radial Bearings. Angular Contact Thrust Bearings. Thrust Ball Bearings. Made to the Blue Prints and dimensions required by customers. "Star" Ball Retainers for Thrust, Magneto and Cup and Cone Bearings.

The Bearings Company of America
Lancaster, Penna.

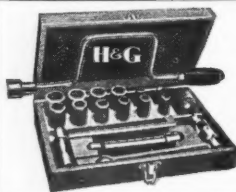
Western Sales Office,
1012 Ford Bldg.,
Detroit, Mich.



Six design and style bumpers from which to make selection for all popular make cars

Write for details.

THE BELLEVUE MFG. CO.
Bellevue, Ohio



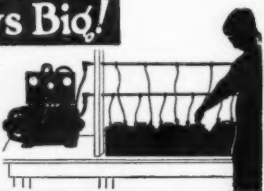
140 Combinations —all in this ONE set

Everything you need, in one small box, compact, accessible, and a real mechanic's outfit. Sockets will not break. Fully guaranteed. Ask your dealer or write us.

The Eastern Machine Screw Corp.
10-20 Barclay Street, New Haven, Conn.

8 Hour Constant Potential Battery Charging Pays Big!

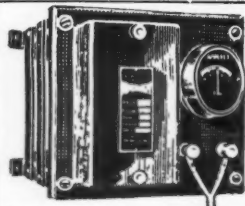
HB 8-Hour Constant Potential Battery Charging doubles your present income. Lowers charging cost, saves one-half on labor, one-half on rental batteries needed. Patented HB Voltage Regulating Winding eliminates reversing. \$20 monthly pays for outfit. 30 days' free trial. Write for information. **Hobart Bros. Co., Box AR 2, Troy, Ohio.**



There is a Harvey Steel Disc Wheel in the various styles which we make for each size of car at interesting prices.



Rim & Wheel Co., Inc.
25 E. Jewett Ave.,
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Automobile and Radio batteries charged for a nickel. Ten million car owners and five million radio fans are prospects for

THE HOMCHARGER

BIG PROFITS. WRITE NOW.
The Automatic Electrical Devices Co.
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"Good for Twenty Years at Hard Labor"
BRUNNER MFG. CO., UTICA, N. Y.

Summer Engine Performance All the Year

The Bishop-Babcock Aquastat—a simple, positive, automatic control of the cooling system for all cars and trucks using pumps—is guaranteed to produce these results: (1) Adjust the water cooling system to cold weather; (2) maintain constant temperature of the water around the engine; (3) prevent over-cooling; (4) warm up engine quickly and reduce use of choke; (5) save fuel; (6) reduce carbon deposits; (7) reduce dilution of oil in crank case. Ten per cent seepage eliminates any special danger of freezing. Write for Aquastat Sales Plan. The Bishop & Babcock Company, Automotive Specialties Division, Cleveland, Ohio.

**BISHOP-BABCOCK
AQUASTAT**

DUESENBERG

The Original Straight-Eight
With Four Wheel HYDRAULIC Brakes

INDIANAPOLIS.

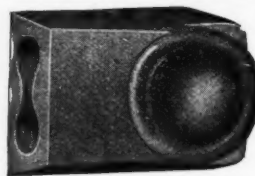
U. S. A.



**Should Be On Every Car
You Sell**

The Spencer Lock Tilting Steering Wheel first adds comfort in the driver's seat—then protects the car from theft. And the insurance it saves pays back the purchase price. Ask your jobber for details. Made for Ford, Dodge, Overland, Chevrolet 490 and Superior, Maxwell, Star and Gray Cars.

The Spencer Mfg. Co.
Spencer Ohio



Jorgensen DOOR SILENCERS

Adaptable for most enclosed cars. Hold doors with a vacuum grip; prevent rattling and noisy banging, tough resilient black rubber. Easily installed. Write for prices, etc. We can supply Vitalic Jorgensen Hood Silencers, adaptable for most cars—a special model for Fords.

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Let us send you our FREE Catalogue on

Huetter's Fly-Wheel GearBands

Huetter Machine & Tool Co.

546 Kentucky Ave.

Indianapolis, Ind.



"Neptune" Water Pump for Fords

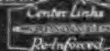
ONLY
\$5.75

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the Water HUMP"**
GREAT STATES CORPORATION
RICHMOND - INDIANA

Duo-Wear

THE TIRE CHAIN OF DOUBLE SERVICE

The Motorist gets greater mileage. The Dealer gets a better discount.



Write or wire for our proposition.
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CYLINDER HONES

Can be operated without removing engine from vehicles. An absolutely true hole. Small first cost. Large profits. Have efficiency of large, expensive grinders.



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MICHIGAN

There's a GILLIAM Bearing for practically every application and every location in every make of automotive equipment.

Cups Cones Rollers
Alloy Steel Throughout



THE GILLIAM MFG. CO.

Canton, Ohio

Stop Scraping Motor Bearings

by hand—use the

Elk Machine

100 per cent bearing in 15 minutes. Wrist Pin Bushings Reamed in perfect alignment. Forces out Wrist Pins. Tests squareness of Wrist Pins and Pistons. The most important Labor Saving Tool in shop equipment.

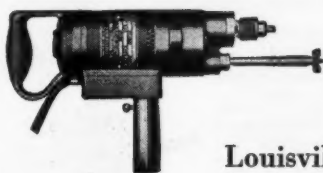
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Elk Machine Tool Corporation

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New York

Get This "Pioneer" Garage Special



Electric Drill
and Valve Grinder

Greatest time and money saver,
as well as money maker, for
your shop—

"It Will Do The Work"

Louisville Electric Mfg. Co.
Incorporated Louisville, Ky., U. S. A.

C. E. Willey, Pres. J. B. McFerran, Secy.-Treas.

The JOHNSON No. 118 Bench Furnace

Is a combination for—

Soldering,
Heat-treating,
Metal Melting

Quick acting, high temperature, most durable and efficient Bench Furnace for every bench.

Does Not Require a Blower.

Write for catalog of Gas Appliances.

JOHNSON GAS APPLIANCE CO.
Cedar Rapids IOWA



ANCHOR Automobile Lamps



You profit more by selling Anchor lamps. Seven years of close study and experience is in their design. The materials in them are the best the market affords. They give good, long service without complaints or make-goods. Our low manufacturing and selling costs allow you to make an extra margin of profit.

A sufficient stock of Anchor lamps requires small investment, and is cleaned out quickly by the constant demand. Jobbers and dealers both make money on the trouble-free Anchor line. Send for size and price lists with generous discounts.

ANCHOR ELECTRIC CO.

557 W. JACKSON BLVD.

CHICAGO, ILL.

Protection, Is the Chief Function



The New Duo-Convex, double convex spring bars with back bar reinforcement. Black or nickel. Prices \$15 to \$22, according to size and finish. Without back bar, for Fords and other light cars, \$12 to \$15.



The New Sport Duplex Model. Most beautiful bumper on the market. Black japan or nickel. Medium cars, black, \$14.50; nickel, \$16.50. Large cars, full nickel only, \$24.

of New Era Bumpers. The strong, resilient broad Spring Bumpers protect lives and in protecting lives save property from destruction.

It is time to begin thinking about Something For The Car For Christmas.

Write for Catalog.

NEW ERA SPRING AND SPECIALTY CO.

SMALLEY DANIELS, President

70 Cottage Grove St.

Export Department, 130 W. 42nd St., New York City

Grand Rapids, Mich.

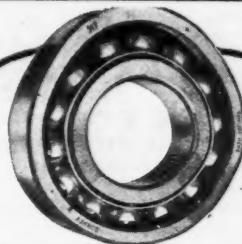


A Better Motor

The development of this new Waukesha Bus and Truck Motor is a long stride in "heavy motor" efficiency. Its low operating costs builds bigger profits. Write for details.

The Waukesha Motor Company
Waukesha, Wisconsin

BUS and TRUCK MOTORS



Greatest Load Capacity for size makes Gurney Ball Bearings best for Replacement Work.

Let our Engineers assist you.

GURNEY BALL BEARING CO.
Jamestown, N. Y.

GURNEY

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IT'S EASY TO SELL
"The only oil ring with a mileage guarantee"
 "Sav-Oil" is stamped on bottom of every ring
The Sav-Oil Ring Mfg. Co.
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WARNER GEAR COMPANY
MUNCIE, INDIANA



CLUTCHES, TRANSMISSIONS, CONTROLS, DIFFERENTIALS

ALVORD QUALITY TOOLS




Taps, Dies, Cutters, Drills, Reamers
 Send for Catalog
ALVORD REAMER & TOOL COMPANY
 Millersburg, Pa.

FOLBERTH
Automatic
WINDSHIELD CLEANER



Pat. *"It Cleans While You Drive"*
 A good profit for you in this wonderful, fast-selling necessity. Ask your jobber or write.
THE FOLBERTH AUTO SPECIALTY CO., CLEVELAND

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Adjustable. Two sizes will clamp any hose of any diameter. Made from cold rolled steel out of wire. No rough edges to cut hose. Put on in less than a minute. Everlastingly leak-proof. Order Universal Hose Clamps. Trademark on every clamp and carton. Get them from your jobber—or write us.
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Be the local Logan Man — Let us show you how easy and how profitable it is to install Logan Ring Gears.
LOGAN FLY WHEEL RING GEARS
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SIX
"EVERLASTING PERFORMANCE"
 Engine Sealed and Guaranteed for 2 Years
R & V MOTOR COMPANY East Moline, Ill.

STEVENS TOOLS
SPEED UP



OVER 50 WONDERFUL SHORT CUTS IN NEW CATALOG T-105
 ASK FOR IT
STEVENS & COMPANY
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Send Us Your Armature Repair Work

FORD ARMATURES REWOUND \$2.00




MOST ANY TWO UNIT GENERATOR ARMATURE \$5.00
ALL WORK GUARANTEED—WRITE FOR PRICE LIST
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Welco Accelerator
 Quickly installed on Fords




Works independent of throttle. Adjusting nut sets idling speed. Complete with heel rest, screws and adjusting nut, in attractive carton. Ask your Jobber.
 Welco Products include Step Plates, Blanket Holders, Gas Tank Caps.
The Welker-Hoops Mfg. Co., Middletown, Conn.

Victor



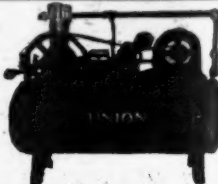
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 A quality group of fast selling items for every automotive requirement. Organized to supply the jobber and dealer exclusively.
THE CINCINNATI VICTOR CO.
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 Owners, by purchase, of the Jobbers' Division of the Corcoran-Victor Co.

There's a WATKINS Branch Near You
 If you want genuine Watkins Rebuilt Connecting Rod service, which includes not only rebabbitting the rod to S. A. E. specifications, but equipping the rod with laminated shims, new bronze piston pin bushing and new bolts and nuts, send your old rods to the authorized WATKINS plant nearest you. Rebuilt rods shipped same day they are received.
WATKINS Complete Rebabbitting Service




Forms Simplified, practical forms designed especially for the motor trade. Bookkeeping, shop forms, complete systems. Know your costs.
 Send for free Illustrated Catalog.
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Built For Long Life
 In filling tires be sure to get the details of this Model 150 Union Air Compressor of 2 cylinders. Capacity 5 cu. ft. per minute.
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GENERAL ASBESTOS & RUBBER COMPANY



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ASBESTOS PRODUCTS
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BONNEY FORGE & TOOL WORKS, ALLENTOWN, PA.

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PERFECTION

Silent Timing GEARS

SILENT
DURABLE
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WORLD'S
STANDARD
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KISSEL

The Custom Built Car



The Aristocrats of
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7 Models—Open and Closed
Distributors in principal
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When It Rains— There is big business for
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ADCO WINDSHIELD WIPERS

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A Type and Price for Every Customer

Write for descriptive literature on 76 Adco Products, giving your jobber's name
AMERICAN AUTOMATIC DEVICES CO. Chicago
502 S. Throop St.



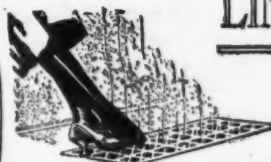
INSHIELD SPOTLIGHT

No Glass to cut—Inside the windshield.
Adjustable to all positions.

Two models—all nickel finish \$10.00. Two sizes, Senior
model 5 1/2" in diameter. Junior, 4 1/2". Black enamel
\$8.50, Junior size only.

Jobbers, Dealers, write for details.

Genuine Inshield Spotlight made only by
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LINENDOLL EXHAUST HEATER

Attractive in appearance, with cleaning
features of removable heating coil with no
connecting joints inside the heater pan to
leak. Meets instant approval. No odor or
noise. Easily installed and operated. Will
boost your winter sales—get our attractive
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THE NORWALK AUTO PARTS CO.
Norwalk, Ohio



Strom

BALL BEARINGS

(2408)

U. S. BALL BEARING MFG. CO., 4551 Palmer St., Chicago, Ill.

All types and sizes of radial (single and double row),
thrust, and angular contact bearings, for new or replace-
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See Our
Full Page
ADVERTISEMENT

Motor Age
Winter Service Issue
November First

THE LINLEY
(Adjustable)

Universal Ball Cover for Fords

Eliminates that noisy rattling, bumping and back-
lash in the rear axle. Saves universal joint, be-
cause it keeps the grease inside, where it belongs.

Jobbers and Dealers: Write today
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LINLEY BROTHERS CO.
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THREE PRODUCTS YOU NEED

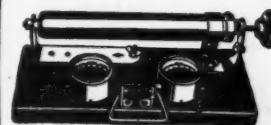
ZIP FRICTION PASTE, for fitting in bearings.
ZIP GRINDING COMPOUND, for valves.
ZIP LAPPING COMPOUND, for lapping in
pistons.

The Original
Water Mixed.
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Write For Samples

THE ZIP ABRASIVE COMPANY
THE ZIP MFG. CO.

Ask Your Jobber.
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TEST YOUR BATTERIES

by the Chart Method. Something
New. Send for free booklet, today.

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Electric Controlling Apparatus

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"The Best-Equipped Shop
Gets the Business"



Every Tungsten Spark Plug Sealed
in a Metal Container

"Always On The Job"

Tungsten Spark Plug Co., St. Joseph, Mo.



—the Solution of the
used car problem!

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MOTOR TRUCKS 'for low-cost hauling'

Models range from the 2,000-lb. Speed Truck to the 10,000-lb. truck.

Some territory is still open for dealers.

International Harvester Company of America

(Incorporated)
Chicago, U. S. A.

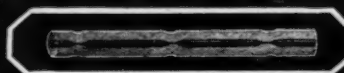


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BRANCHES

AHLBERG BEARING COMPANY

321 EAST TWENTY-NINTH STREET, CHICAGO ILLINOIS

REQUIRES
ONLY
HEAT



SAMPLE
FREE

HIGH SPEED HOIST
THE RIGHT
MEANS HIGH SPEED PRODUCTION

WRIGHT
MANUFACTURING COMPANY
LISBON, OHIO, U. S. A.

But Be Sure
It's
WRIGHT

"UNICO" QUICK-SEATING "UNIC-OIL"
Plain Step Cut Oil-Control

PISTON RINGS

Ask for Samples and Prices

UNICO MOTOR PRODUCTS CORP., 4969 St. Louis Ave., St. Louis, Mo.

STUTZ SIX—It's a Great Car

STUTZ Speedway Four
America's Pre-eminent Sport Car

STUTZ MOTOR CAR COMPANY of AMERICA, Inc., Indianapolis, Ind.
Builders of the Original and Genuine Stutz Motor Cars

SKIVED PATCHES
CORD AND FABRIC

Distributors Wanted

THE LEO MEYER CO., AKRON, OHIO
Established 1914

YALE OILING SYSTEM
Trade Mark Pat. June 4, 1918. Other Pats. Pend.

FOR FORDS

Jobbers cash in now on strong advertising and sales campaign. Over 1,000 Ford dealers sell it. Write for discounts.

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SIoux
Trade Mark Reg. U. S. Pat. Office

Garage Tools
make well equipped shops. Ask your jobber.

Fast and ACCURATE for re-facing, reseating and grinding all size valves.

Sioux Flexible Shaft and Attachments take the tool to the work.

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Piston Rings for Every Need

GILL MFG. CO., 8300 South Chicago Ave., Chicago

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Tires and Tubes
"Wear-Longest"

THE NEW EMPIRE DISTRIBUTION PLAN enables dealers to make extra profits on these well known super-standard casings and tubes.

Empire Tire & Rubber Corp
TRENTON NEW JERSEY

Steel Dump and Commercial Bodies for Every Purpose

The Galion Allsteel Body Co.
Galion, Ohio

We Re-Babbitt connecting rod or main bearings for any make of car, truck or tractor (including Orphan Car Bearings). Nothing but Genuine Babbitt of S. A. E. Specifications used—Machined and reamed to very close tolerances—oil grooves duplicated—cast in rods aligned—Wrist Pin Bushings, Bolts and Nuts furnished at cost when ordered—Our 24-HOUR MAIL ORDER SERVICE means that we can often Re-Babbitt quicker than you can replace with a new bearing and at less cost to you—all work guaranteed—Mail your next "hurry up" job to us.

Ship at once or write for price list and further particulars.

INTERSTATE BEARING CO., Herkimer, N. Y.

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Be a link in the national chain of Dealers selling the genuine, original Bosch Products. Send for details.

Robert Bosch Magneto Co., Inc.
The Genuine, Original Bosch
Otto Heins, Pres., 123 West 64th St., New York

Wood-Imes

SELF-ALIGNING BURNISHING MACHINE

Makes it possible to fit over-size pistons without removing engine from the car when the variations do not exceed 5/1000 of an inch. Cylinders slightly tapered, out of round, or with shoulders worn by pistons or rings may be made round, straight and true. Price \$25. 12 ounce can Wood-Imes Compound, \$1.50. Write for complete details.

WOOD-IMES MFG. CO., Minneapolis, Minn.

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Automotive Products

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MINNEAPOLIS, U.S.A.
Established 1910

Bearing Blue
Enamel (Air Drying)
Enamel (Cylinder)
Fan Belts
Gasket Cement
Graphite
Leather Dressing
Metal Polish and Nickel Polish

Patch
Pedal Pants
Radiator Cement
Orange Shellac
Rubber Cement
Shellac (Gasket)
Spring Lubricant
Tire Mica and Tire Talc

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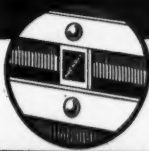
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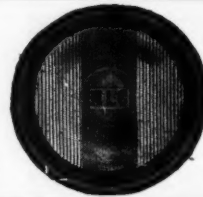
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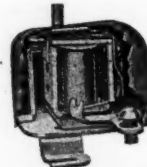


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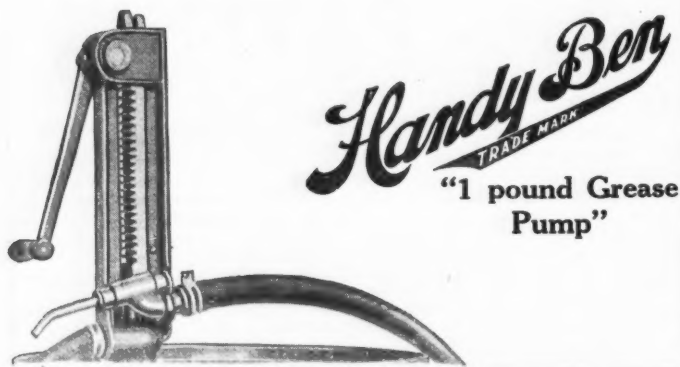
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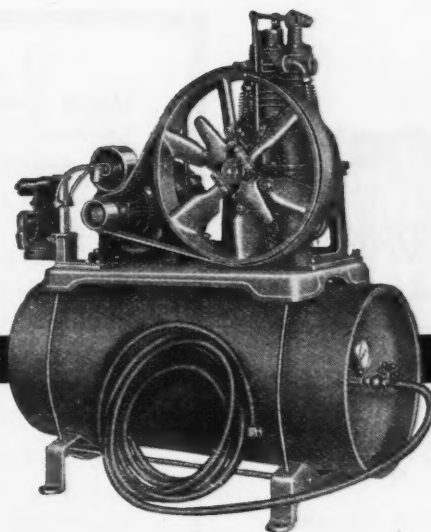
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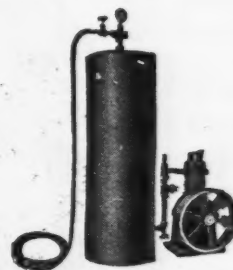


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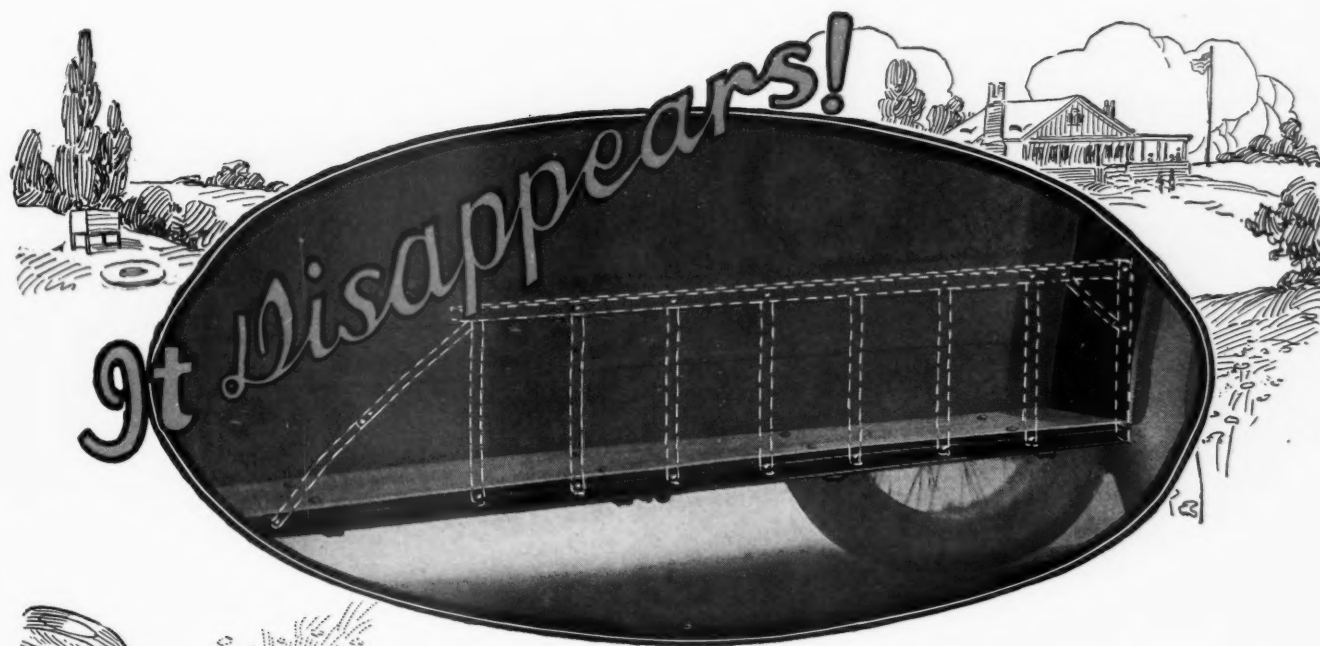
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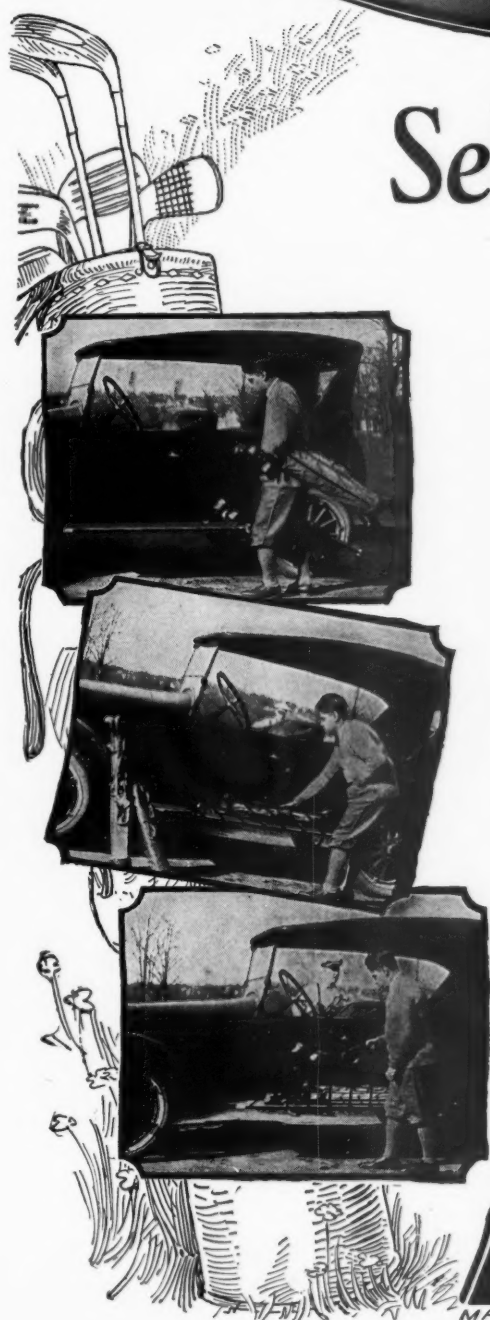
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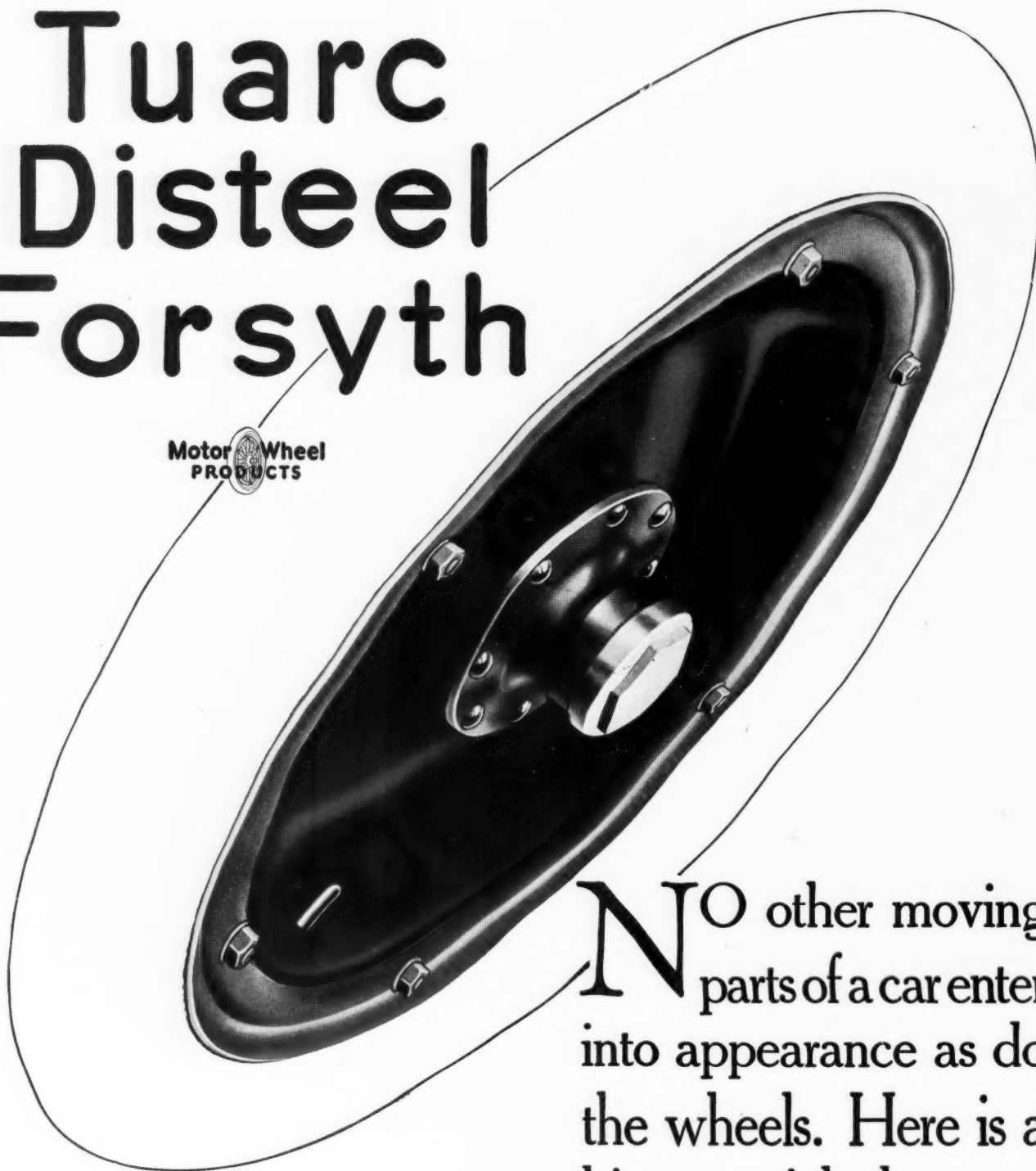
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